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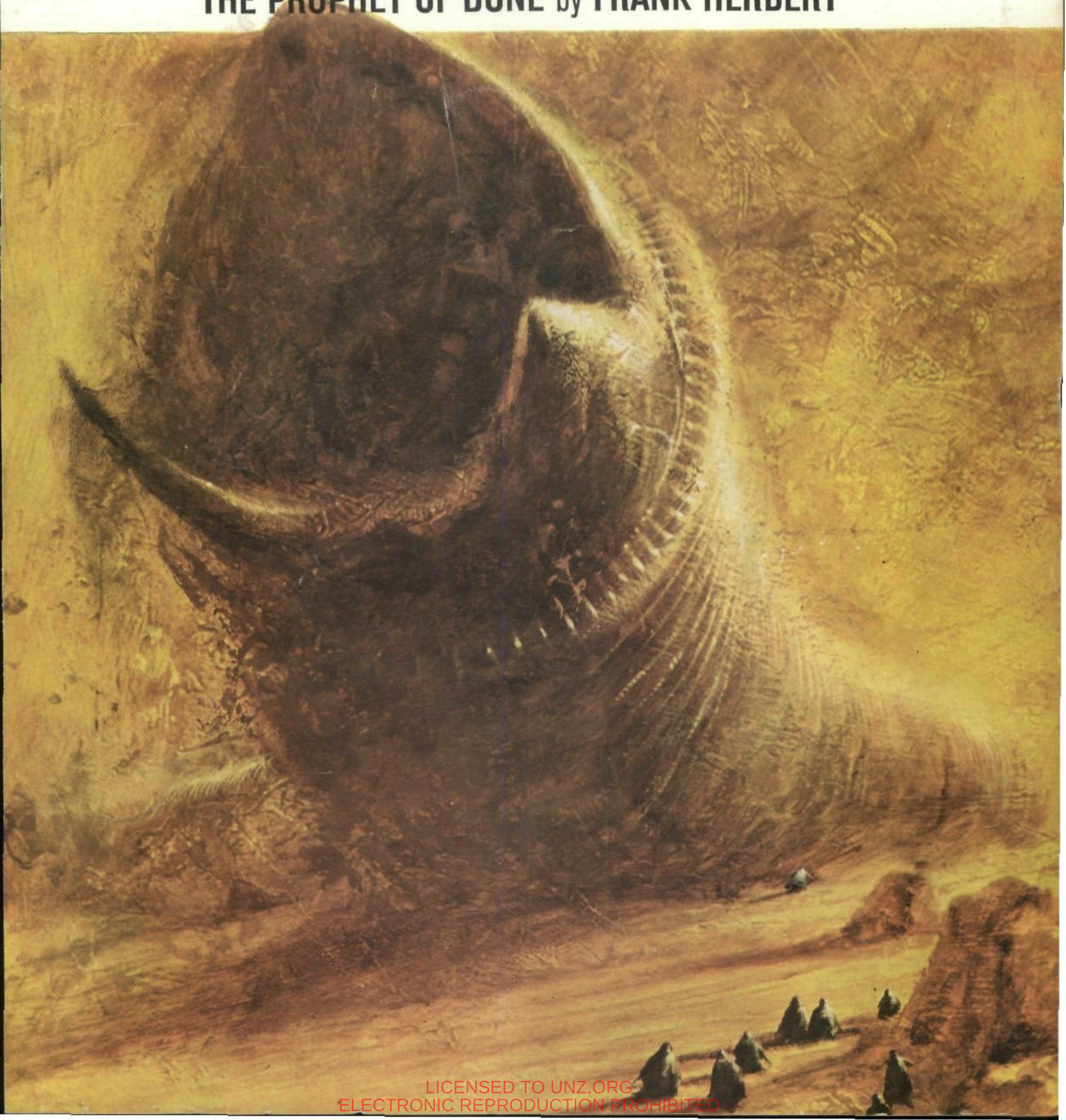

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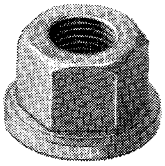
this is one  of them

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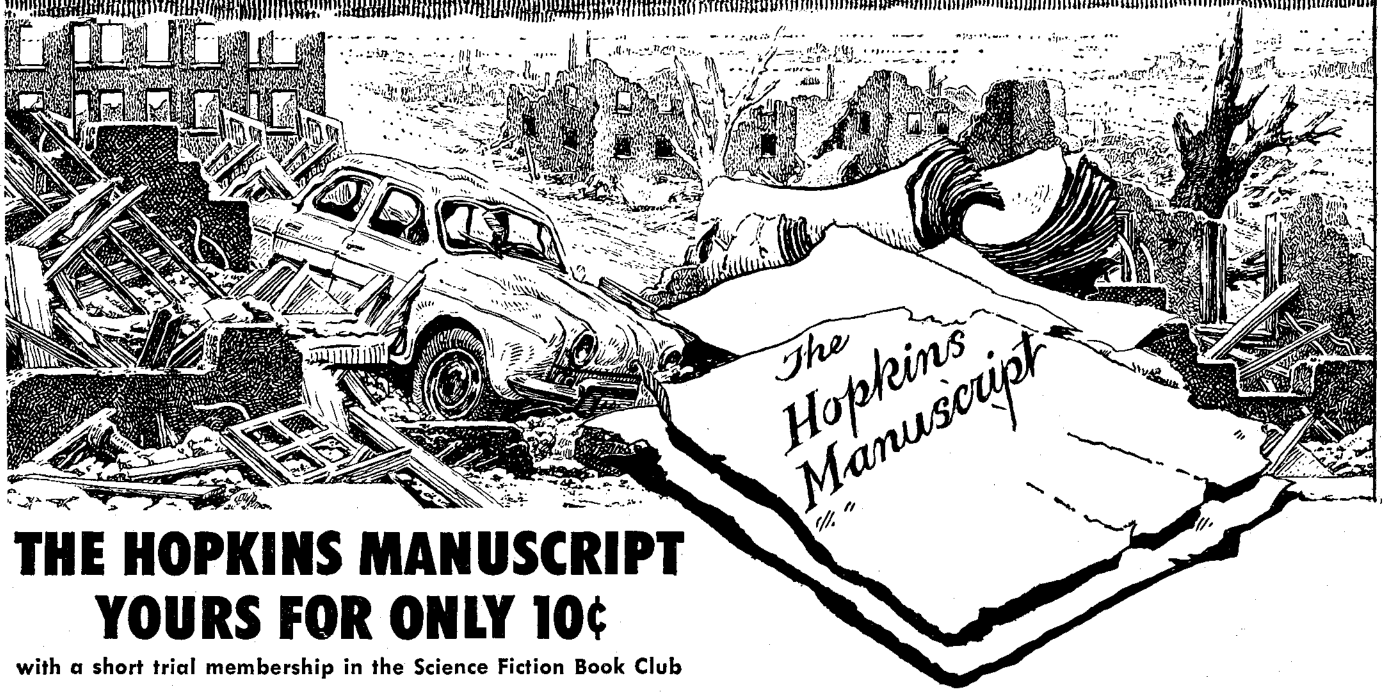

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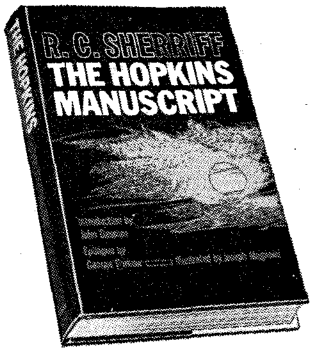

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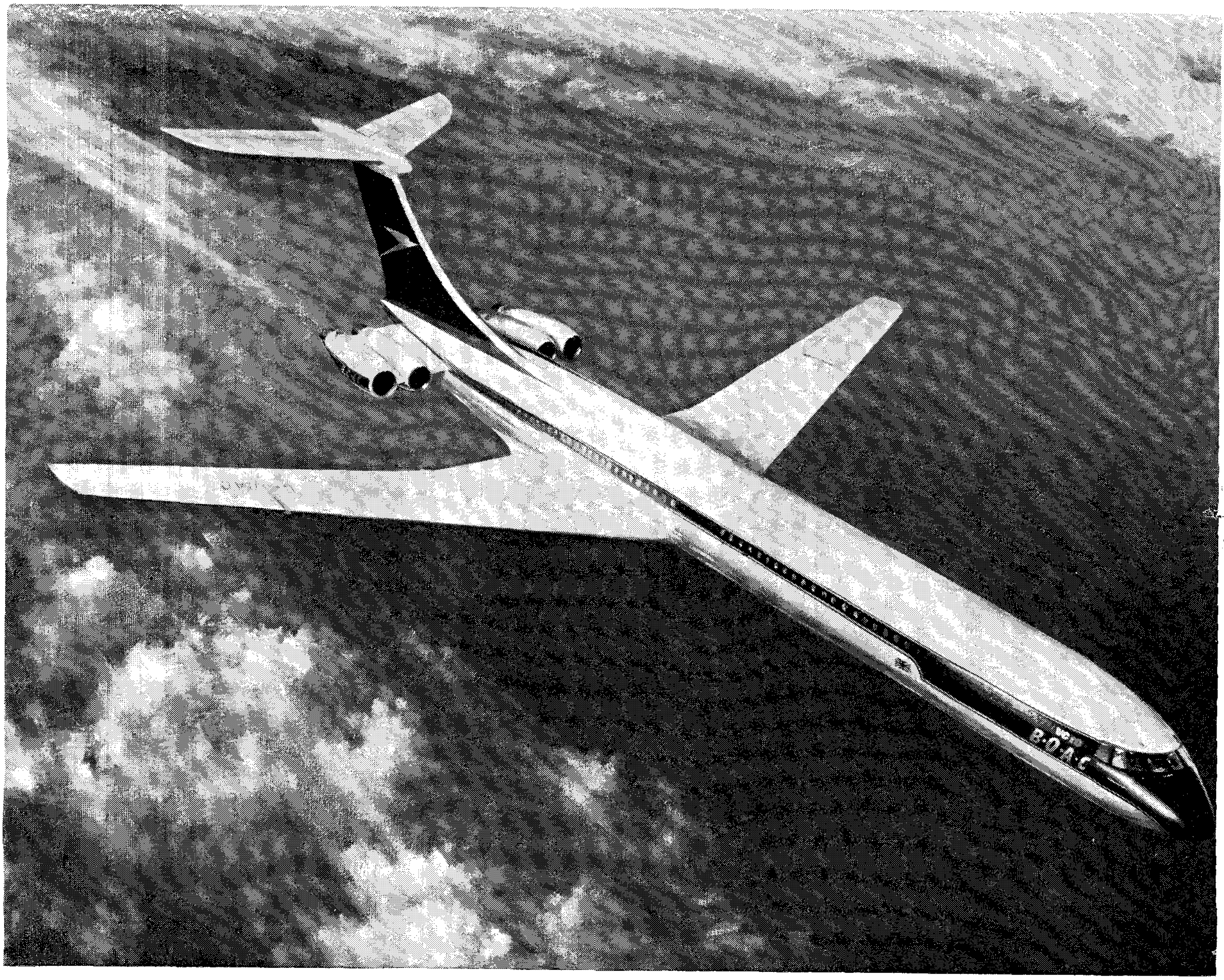

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SCIENCE FACT

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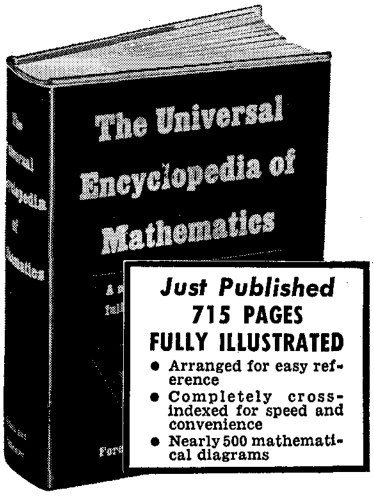

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BRASS | TACKS

Dear Mr. Campbell:

The following is in reference to Mr. Embs' letter published in the December, 1964 issue of Analog.

A steel shaft of rest length eleven light-years, when traveling at sufficient velocity, according to the Lorentz contraction, will have shrunk 1.1 light-years. This same shaft, sliced in half, will shrink to two shafts of length .55 light-years leaving a gap between them. This gap, however, shrinks at the same rate as the rod, so that instead of being 4.95 light-years as Mr. Embs claims, it will be .495 light-years in length. The sum, then, of the two shrunken pieces of shaft plus the gap between them is 1.595 light-years. If one were to keep dividing the shaft into fragments and accelerating them, one would find that, in general, the length of shrunken pieces plus shrunken gaps would be:

$$L = .99\frac{(x-1)}{(\;x\;)} + 1.10$$

where x is the number of shaft fragments. By allowing x to approach infinity, one finds,

$L = 2.09$ light-years, in the limit.

The reason Mr. Embs found that the limiting sum of his shortened segments of shaft and his unshortened gaps between them to be the same as the rest length of the whole shaft is that he allowed the lengths of shaft to become nonexistently small and added only the unshortened gaps; thus, of course, finding that these equal the rest length of the shaft.

May I congratulate you Mr. Campbell, on maintaining such an interesting and stimulating department—I refer, of course, to Brass Tacks. You certainly deserve it.

MICHAEL ANDREASEN

1054-9th Street
Albany, California

This raises a lovely question! What is the meaning of "space moving through space at the near light-speed"? Because the gaps are "space", not matter, and to undergo shrinkage, they must be moving. So . . . what's "space moving through space"?

Dear John:

I have just read in Analog August '64 Mack Reynolds "Genus Traitor" and thoroughly enjoyed it.

Of course, what interested me the most was the fact that Ben Fullbright was suffering from the same disease which caused all Mankind to persecute him, as he also was prejudiced by preferring to accept the creators of the Martian satellites as enemies of both planets. So the very thing which he's been trying to prevent—unnecessary destruction brought about by pure prejudice—he would have been creating by giving all Mankind the idea that there is a third intelligence warlike towards us, all based on purely the "suspicion" that the two satellites were a spying mechanism. They could have been any number of things, with two common denominators: "Peaceful" & "Warlike". And until one has undoubtedly been *proven* as such the other should never be discarded.

All in all, when you do some deeper considering, "WHAT IS OUR *REAL* ENEMY?"

Any unknown intelligence? In my opinion "NO". Until proven they may be either "peaceful" or "warlike". And regardless of their physical shape, they probably will have the same problem as we have with their own prejudices.

So what is our REAL ENEMY. And by "OUR" I want to mean any intelligences we could get into communication with, as we're all some sort of "BEINGS". I would say it is "IGNORANCE," whichever race, group, genus, or planetdweller you happen to belong to, and the greatest enemy of all is the "IGNORANCE" which dwells in one's own mind, which then means *MY* mind. Actually a better way of putting it would be "IGNORANCE OF OWN PERSONAL MOTIVATION" or "What is my *real* reason for my action" and boy it takes some looking to see those hidden motives which we cheat ourselves with.

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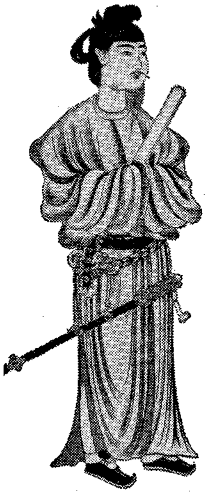

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PICTORIAL. Bradley Smith, who is known throughout the world for his incomparable photographs of art works, was given access to priceless and fragile masterpieces in museums, Buddhist temples, Shinto shrines and private collections (including that of the Imperial Household) in Kyoto, Nara, Atami, Yokohama, Kamakura, Tokyo and elsewhere in Japan. His color photographs, made especially for this book, are unretouched.

HISTORICAL. During the writing and photographing, Mr. Smith was in consultation with leading scholars in Asia and the West. Two of the most distinguished have contributed to the book. The *Art Introduction* is by NAGATAKE ASANO, Director of the Tokyo National Museum. The *Historical Introduction* is by MARIUS B. JANSEN, Professor of Japanese History and Director of the East Asian Studies Program at Princeton University.

PRODUCTION. The 6-color lithography is by Japan's finest printers, Toppan of Tokyo. Color endpapers and dividers are of Japanese handmade papers. The book is 8¾" x 12½", bound in woven cloth on which the title in Japanese is stamped in gold after a model by a master calligrapher.

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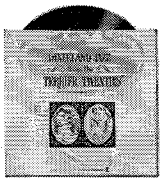

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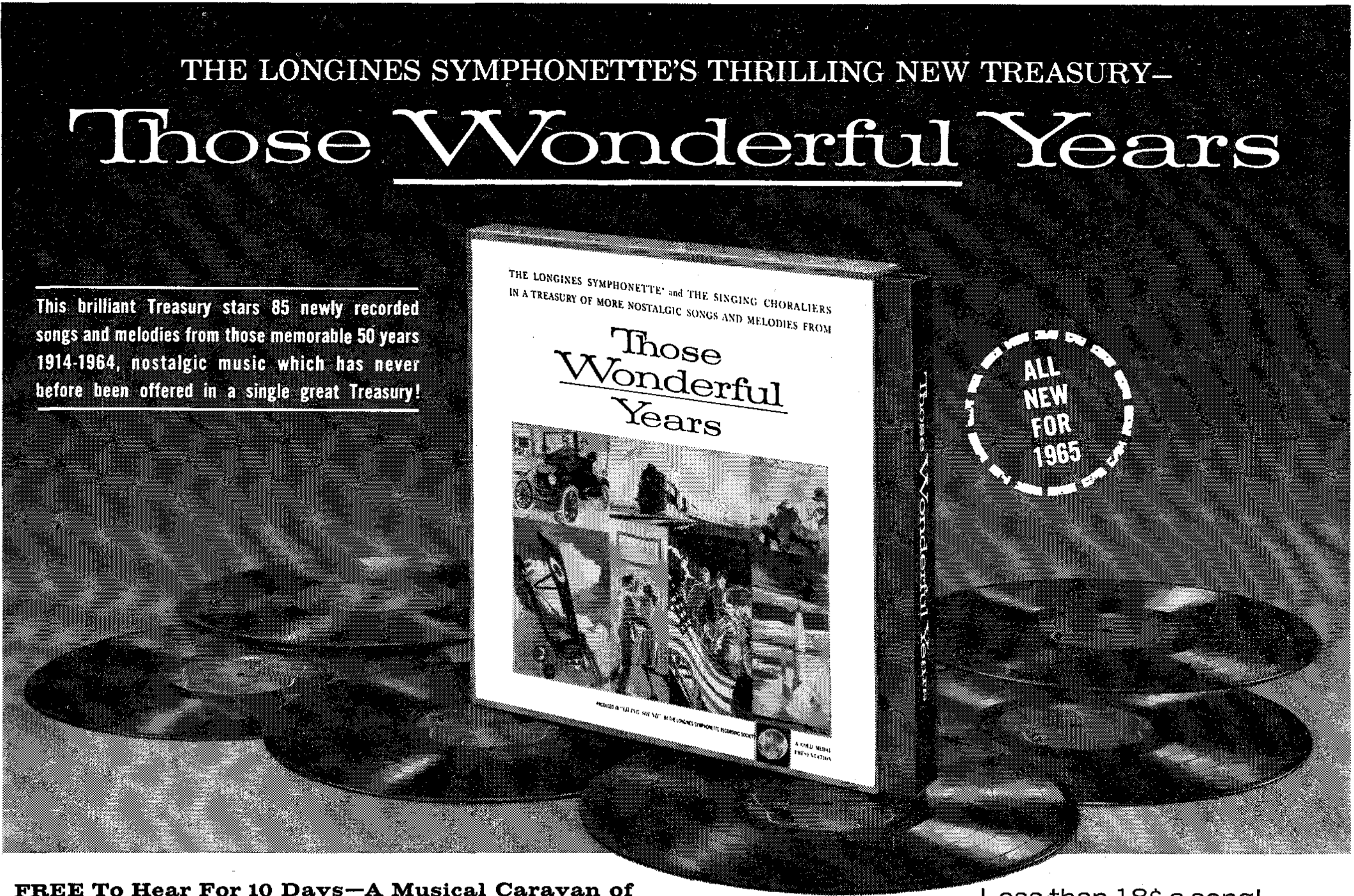

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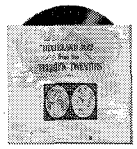

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TIME FOR AMERICA

editorial by

JOHN W. CAMPBELL

In the last few years, definite evidence has been found that the Norse Vikings established a colony on the northern tip of Newfoundland, after exploring the coast southward from Labrador. The relics of their colony, including an iron-working, have been found. The colony was established some five hundred years before Columbus set forth on his famous journey to India.

It was a good try, the Vikings made; how long the colony actually lasted, we don't know, but we do know that men were refining iron, and women were spinning and weaving clothes. Their tools are still there . . . and if the Norse hadn't been such fanatically neat housekeepers, picking up after themselves with such scrupulous neatness, the evidence would have been a lot easier to find.

But—the colony didn't last. The Norse had to pull back to Greenland and Iceland whence they'd come—and which their modern descendants, the Danes, still hold. Incidentally, few Americans seem to realize that the oldest existent republic on Earth is neither European nor Asian—it's Iceland, which will celebrate the one thousandth anniversary of its founding shortly.

Why didn't the Norse colony in America succeed?

Simply . . . it turned out, it wasn't time for America yet.

Five hundred years later, when Columbus egregiously underestimated the diameter of the Earth, despite the fact all educated men had known the Earth was spherical and about 7,000-8,000 miles in diameter for the preceding fifteen hundred years (only peasants and savages thought it was flat by 1400 A.D.)—despite error piled on error, and misunderstanding confounded by mismanagement—Columbus' colony succeeded.

It wasn't that the Caribbean offered a better climate; the Danes are still doing well in Iceland and Greenland, and the Canadians are quite successful in Newfoundland.

It just wasn't time for America in 950 A.D. or so.

Sometimes a good idea won't go over, simply because the time isn't ripe—and usually, the only way you can determine that is by making a try at it.

In the past two years, Condé Nast has found that it simply isn't time for an advertising-supported science-fiction magazine; next month, Analog

continued on page 94

1,745,175

THEODORE L. THOMAS

The Twenty Lost Years of Solid-State Physics

It's darned seldom an instance comes along that shows that a truly important breakthrough discovery was actually made—and completely ignored by Science. It takes rather special conditions to prove it.

But—once in a while—those very special conditions necessary for proof do show up. The introduction of solid-state electronics was, beyond doubt, a major breakthrough. . . .

But the first solid state amplifiers weren't built by Bell Labs after WW II. . . .

The year 1930 was not much of a year. The Great Depression was in full swing. The Notre Dame football team, coached by Knute Rockne, was the national football champion. The Institute for Advanced Study was established at Princeton, New Jersey. The planet Pluto was discovered. Thomas Edison installed an experimental electric passenger train between Hoboken and Montclair, New Jersey. And Dr. Julius Edgar Lilienfeld was granted a United States patent on the transistor.

It is reasonable to think that any year that produced the invention of the transistor would be a great scientific year. The trouble with 1930 was that nobody noticed. Here was an invention that twenty-six years later was to produce a Nobel Prize, an invention that was to found an industry and bring about a burgeoning of the branch of science known as solid-state physics. Yet our culture was in such a state that at the time the transistor was patented for all to see, no one saw. It is not enough to say that Lilienfeld was ahead of his time. The twenty years that elapsed between his patent and the transistor's rediscovery and refinement is not enough for that sort of alibi. Lilienfeld understood it. Why not others?

Dr. Lilienfeld's patent is U. S. 1,745,175, issued 28 January 1930 on an application filed in the United States Patent Office 8 October 1926. The same patent application had been filed in Canada even earlier on 22 October 1925. And a fully operating transistor back in 1925 is a pretty interesting technical phenomenon. Under United States patent law Lilienfeld's invention was really reduced to practice when he filed his first application back in 1925. In his patent Lilienfeld points out that up to the time of his invention, thermionic tubes or valves had been generally used to amplify oscillating currents. He says that his invention accomplished the same thing in a solid. Even the drawings for the patent have the familiar look of transistor circuitry. But see for yourself. Here is the entire patent, complete with claims.

Patented Jan. 28, 1930 **1,745,175**

UNITED STATES PATENT OFFICE

JULIUS EDGAR LILIENFELD, OF BROOKLYN, NEW YORK

METHOD AND APPARATUS FOR CONTROLLING ELECTRIC CURRENTS

Application filed October 8, 1926. Serial No. 140,363, and in Canada October 22, 1925.

The invention relates to a method of and apparatus for controlling the flow of an electric current between two terminals of an electrically conducting solid by establishing a third potential between said terminals; and is particularly adaptable to the amplification of oscillating currents such as prevail, for example, in radio communication. Heretofore, thermionic tubes or valves have been generally employed for this purpose; and the present invention has for its object to dispense entirely with devices relying upon the transmission of electrons thru an evacuated space and especially to devices of this character wherein the electrons are given off from an incandescent filament. The invention has for a further object a simple, substantial and inexpensive relay or amplifier not involving the use of excessive voltages, and in which no filament or equivalent element is present. More particularly, the invention consists in affecting, as by suitable incoming oscillations, a current in an electrically conducting solid of such characteristics that said current will be affected by and respond to electrostatic changes. Means are associated with the aforesaid conducting solid whereby these electrostatic changes are set up conformably with the incoming oscillations which are thus reproduced greatly magnified in the circuit, suitable means being provided, also, to apply a potential to the said conducting solid portion of the amplifier circuit as well as to maintain the electrostatic producing means at a predetermined potential which is to be substantially in excess of a potential at an intermediate point of said circuit portion.

The nature of the invention, however, will best be understood when described in connection with the accompanying drawings, in which—

Fig. 1 is a perspective view, on a greatly enlarged scale and partly in section, of the novel apparatus as embodied by way of example in an amplifier.

Fig. 2 is a diagrammatic view illustrating the voltage characteristics of an amplifier as shown in Fig. 1.

Fig. 3 is a diagrammatic view of a radio receiving circuit in which the novel amplifier is employed for two stages of radio frequency and two of audio frequency amplification.

Referring to the drawings, 10 designates a base member of suitable insulating material, for example, glass; and upon the upper surface of which is secured transversely thereof and along each side a pair of conducting members 11 and 12 as a coating of platinum, gold, silver or copper which may be provided over the glass surface by well-known methods such as chemical reduction, etc. It is desirable that the juxtaposed edges of the two terminal members 11 and 12 be located as closely as possible to each other; and substantially midway of the same there is provided an electrode member 13, which is of minimum dimensions to reduce capacity effect. This member consists of a suitable metal foil, preferably aluminum foil, and may conveniently be secured in position by providing a transverse fracture 14 in the glass and then reassembling the two pieces to retain between the same the said piece of aluminum foil of a thickness approximating one ten-thousandth part of an inch. The upper edge of this foil is arranged to lie flush with the upper surface of the glass 10.

Over both of the coatings 11 and 12, the intermediate upper surface portion of the glass 10, and the edge of the foil 13 is provided a film or coating 15 of a compound having the property of acting in conjunction with said metal foil electrode as an element of uni-directional conductivity. That is to say, this coating is to be electrically conductive and possess also the property, when associated with other suitable conductors, of establishing at the surface of contact a considerable drop of potential. The thickness of the film, moreover, is minute and of such a degree that the electrical conductivity therethru would be influenced by applying thereto an electrostatic force. A suitable material for this film and especially suitable in conjunction with aluminum foil, is a compound of copper and sulphur. A convenient way of providing the film over the coatings

11 and 12 and the electrode 13 is to spatter metallic copper by heating copper wire within a vacuum, or by depositing copper from a colloidal suspension, over the entire upper surface and then sulphurizing the deposited copper in sulphur vapor, or by exposure to a suitable gas as hydrogen sulphide or a liquid containing sulphur, as sulphur dissolved in carbon bisulphide.

To produce the required flow of electrons through the film 15 a substantial potential is applied across the two terminal coatings 11 and 12 as by conductors 16 leading from a battery or like source 17 of direct current. As shown in the diagrammatic view, Fig. 2, the dimensional volt characteristics of the device indicate a substantially steady voltage of value *a* over the coating 11 and a corresponding steady voltage *b* of diminished value over the coating 12, while over the portion of the surface between said coatings the voltage in the film 15 will be according to the gradient *c*. As aforesaid, the electrode 13 is located substantially midway of the inner ends of the terminal coatings 11 and 12 and there is arranged to be supplied thereto a potential indicated by the value *d*, Fig. 2, and somewhat in excess of the voltage prevailing along the gradient *c* at this point. This potential may be applied by means of a battery or like source of potential 18, the negative pole of which is connected to the negative pole of the battery 17. In the circuit of the electrode 13 and source of potential 18 is also included some exterior source of oscillating or fluctuating current, which source is indicated, by way of example, in Fig. 3, as the antenna 20 of a radio communication circuit.

The effect of thus providing an excess positive potential in the electrode 13 is to prevent any potential in the oscillating circuit hereinbefore described from rendering said electrode of zero potential or of a negative potential, which would then permit a current to pass from the electrode edge to the film 15; as in the reverse direction where a positive voltage is maintained, the two members—namely electrode and connecting film—act as an electric valve to prevent the flow. Maintaining a positive potential at this point, however, insures that the flow of the electrons from the piece 11 to the piece 12 will be impeded in a predetermined degree, a variation therein being effected conformably to the changing amount of this potential under the influence of the oscillating or fluctuating current introduced. This effect will be repeated on a greatly magnified scale in the circuit of the conducting coatings 11 and 12 and may be reproduced in various circuits or for various purposes as thru a transformer 21, from the secondary of which leads 22 extend to any suitable device, which, as shown in Fig. 3, may be further amplifiers of this character as the radio frequency amplifiers 23 and audio frequency amplifiers 24, the last of which is shown connected to a loud speaker or similar device 25. A current rectifying member 26, however, is necessary where it is desired to convert the radio frequency into audio frequency oscillations. It will be observed that but two sources of potential 27 and 28—which may be combined into a single, properly tapped source—are required and of potentials approximately 30 and 15 volts respectively for the particular elements employed.

The basis of the invention resides apparently in the fact that the conducting layer at the particular point selected introduces a resistance varying with the electric field at this point; and in this connection it may be assumed that the atoms (or molecules) of a conductor are of the nature of bipoles. In order for an electron, therefore, to travel in the electric field, the bipoles are obliged to become organized in this field substantially with their axes parallel or lying in the field of flow. Any disturbance in this organization, as by heat movement, magnetic field, electrostatic cross-field, etc., will serve to increase the resistance of the conductor; and in the instant case, the conductivity of the layer is influenced by the electric field. Owing to the fact that this layer is extremely thin the field is permitted to penetrate the entire volume thereof and thus will change the conductivity throughout the entire cross-section of this conducting portion.

I claim:—

1. The method of controlling the flow of an electric current in an electrically conducting medium of minute thickness, which comprises subjecting the same to an electrostatic influence to impede the flow of said current by maintaining at an intermediate point in proximity thereto a potential in excess of the particular potential prevailing at that point.

2. The method of controlling the flow of an electric current in an electrically conducting solid of minute thickness, which comprises establishing an electrostatic influence in proximity to said flow in excess of the potential prevailing thereat, and varying the said electrostatic influence to correspondingly vary the said flow.

3. The method of controlling the flow of an electric current in an electrically conducting medium of minute thickness, which comprises subjecting the same to an electrostatic influence to impede the flow of said current by maintaining at an intermediate point in proximity thereto a potential in excess of the particular potential prevailing at that point, and varying the degree of excess potential by an impressed oscillating current.

4. An amplifier for oscillating current, comprising a film of conducting material and an output circuit including a source of potential connected across said film, an electrode associated with the said film for maintaining

at the surface of contact a third potential, means to establish in said electrode a voltage substantially in excess of the voltage in the film at the coacting electrode portion, and means to vary the voltage of said electrode.

5. An amplifier for oscillating current, comprising a film of conducting material and and an output circuit including a source of potential connected across said film, an electrode operating in conjunction with said film intermediate the point of application of the potential thereto to provide an element of uni-directional conductivity thereat, means to maintain said electrode at a voltage substantially in excess of the voltage prevailing at the coacting portion of said conducting film, and an input circuit connected with the said electrode and the negative end of the said film.

6. An amplifier for oscillating current, comprising two insulating members, an intermediate strip of aluminum foil, conducting terminals carried by said insulation members upon either side of the said foil retained thereby, a film of copper sulphur compound extending over said conducting terminals and the edge of the said aluminum strip, output connections to said conducting terminals for applying a potential across the same, and a connection to the said aluminum strip to maintain the same at a higher potential than that prevailing in the film at its portion opposite the aluminum strip.

7. An amplifier for oscillating current, comprising two insulating members, an intermediate strip of aluminum foil, conducting terminals carried by said insulation members upon either side of the said foil retained thereby and in close proximity thereto, a film of copper sulphur compound extending over said conducting terminals and the edge of the said aluminum strip, output connections to said conducting terminals for applying a potential across the same, and a connection to the said aluminum strip to maintain the same at a higher potential than that prevailing in the film at its portion opposite the aluminum strip.

8. An amplifier for oscillating current, comprising a glass block fractured transversely, a strip of aluminum foil retained in the fracture of said block with an edge substantially flush with the corresponding surface of the block, copper terminal coatings carried by the glass block upon opposite sides of said foil and out of contact therewith, a film of copper sulphur compound extending over the surface of said copper terminals and the aluminum edge, output connections to the said copper terminals to apply a potential across the same, and a connection to the aluminum foil to maintain the same at a higher potential than that prevailing in the film at its portion opposite the aluminum strip.

9. An amplifier for oscillating current, comprising a glass block fractured transversely, a strip of aluminum foil retained in the fracture of said block with an edge substantially flush with the corresponding surface of the block, copper terminal coatings carried by the glass block upon opposite sides of said foil and out of contact therewith, a film of copper sulphur compound extending over the surface of said copper terminals and the aluminum edge, output connections to the said copper terminals to apply a potential across the same, a connection to the aluminum foil to maintain the same at a higher potential than that prevailing in the film at its portion opposite the aluminum strip, and a source of fluctuating current in circuit with the aluminum foil.

In testimony whereof I affix my signature.

JULIUS EDGAR LILIENFELD.

Jan. 28, 1930. J. E. LILIENFELD 1,745,175

METHOD AND APPARATUS FOR CONTROLLING ELECTRIC CURRENTS

Filed Oct. 8, 1926

Fig. 1.

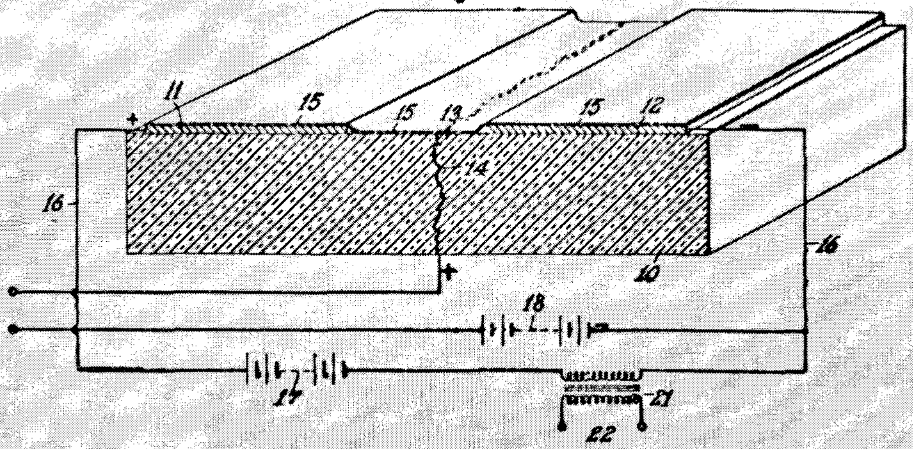
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Fig. 2.

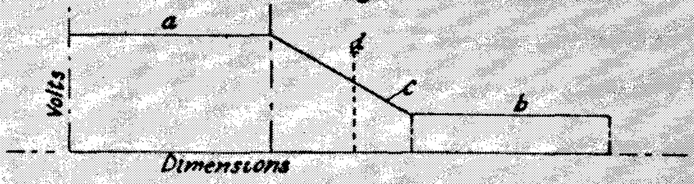
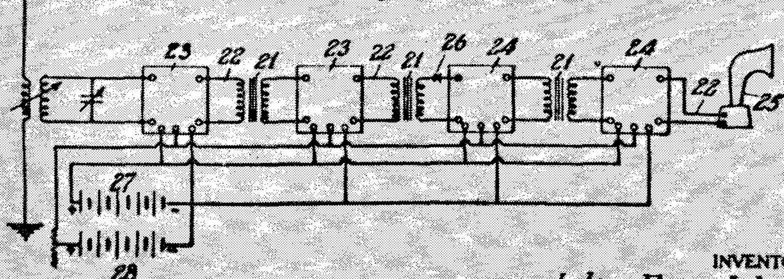


Fig. 3.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INVENTOR
Julius Edgar Lilienfeld
BY
ATTORNEY

THE TWENTY LOST YEARS OF SOLID-STATE PHYSICS

1,745,175

There is little doubt that the patent describes and claims a device that today would be known as the NPN transistor. Here is the way it works.

The film or coating 15 having a minute thickness is clearly cuprous sulfide, and is very similar to cuprous oxide. Its thinness and its composition make it an n-type semiconductor, one with an excess of free electrons.

The aluminum foil 13 protrudes into the center region of the cuprous sulfide film. Due to the method of forming the cuprous sulfide film, there is little doubt that atoms of aluminum will intrude into the cuprous sulfide structure. There will then be formed a region of a deficiency of electron-pair bonds. In other words, a p-type semiconductor is formed at the place where the aluminum joins the cuprous sulfide. The whole arrangement gives rise to an NPN junction transistor. The circuit shown in Fig. 1 of the patent can be easily recognized as a modern common emitter circuit where the emitter is maintained at ground potential. The thin film over the coating 12 is the emitter. The thin film over the coating 11 is the collector. And the narrow region around the number 13 is the base.

The device works just the way a modern NPN transistor does with the common emitter circuit. When the incoming signal, say from a radio antenna, enters the circuit at the two leads on the left of Fig. 1, the incoming voltage from that signal will either aid or oppose the base emitter battery 18. If it aids it, additional electrons will be injected into the p-type region at 13. If it opposes it, fewer electrons will be injected. No matter which way the change, the current through the entire top film of cuprous sulfide will change according to the voltage change. This causes a change in the current flowing through the entire collector-emitter circuit, including the collector-emitter battery 17. The change in current is picked up by the transformer 21 as an amplified signal from the antenna, and there you are.

Dr. Lilienfeld was not able to explain accurately how the transistor worked. The theory of semiconductors did not begin to come into its own until about 1948. In the absence of what is now considered to be the true theory, Lilienfeld relied on an explanation based on bipoles; he said that the atoms or molecules behave like bipoles and assume different directions. These directions control the flow of electrons in the thin layer. Lilienfeld's description of the theory of operation was careful, though. He was not out on a limb if his theory was wrong. Part of the careful language was doubtless due to Lilienfeld's patent attorney, Frederick F. Shuets. In fact, the Lilienfeld patent is a masterful example of the patent attorney's art at its best. The description is clear, complete, and short. It is good, unpretentious writing that says everything that should be said, and no more. Mr. Shuets is no longer on the register of patent agents or attorneys; he may have died. Lilienfeld himself may have died in 1963; at least there was an announcement of his death. He had been a professor at the University of Leipzig in Poland, and he became a United States citizen in 1935.

It is of no moment that Lilienfeld's theory of operation as explained in his patent is wrong. It is a fundamental rule of patent law that an inventor need not explain his invention. If he offers an explanation, and it is wrong, there is no penalty. Inventions often lie at the forefront of technology, way ahead of any theories to explain them. The nature of an invention and the patent that describes it is such that no explanations are necessary. It is the claims in the patent that define the invention. And the claims can only, according to law, cover a process, a machine, an article, or a composition. These are all practical things that can

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THE CASE OF THE PARADOXICAL INVENTION

RICHARD P. McKENNA

This invention clearly won't work according to well-established laws of physics. The only trouble is, that if it doesn't work, then certain other well-established laws of physics have been demolished. Because if it does work, the Law of Conservation of Energy just went down the drain. But if it doesn't work, then cyclotrons aren't possible, and betatrons are clearly nonsense. Our physicist readers are cordially invited to find the catch . . . or the loophole, whichever you choose to call it!

It was remarked in these pages some years ago that a paradox in logic is analogous to the artificial smell that gas companies put into natural gas. The smell adds nothing at all to the properties of the gas, but it *does* serve as a warning when there's a leak—in other words, when something is wrong. Similarly, a paradox in a logical or philosophical proposition indicates that something is wrong in the fundamental concepts which lie behind it. To produce a rigorous resolution of such paradoxes, a completely novel approach to the problem is usually required, and often the development of new disciplines.

A paradox in logical theory is one thing; a paradox in engineering is quite another. When such a contradiction in terms arises from the application of well-known physical laws of long standing, it would seem that something is very wrong indeed.

This article is concerned with precisely such a situation. It deals with an invention—a charged particle motor—which apparently creates a genuine paradox from which there seems to be no escape but the alteration of a fundamental law of physics. The motor *must* work, but it *cannot*.

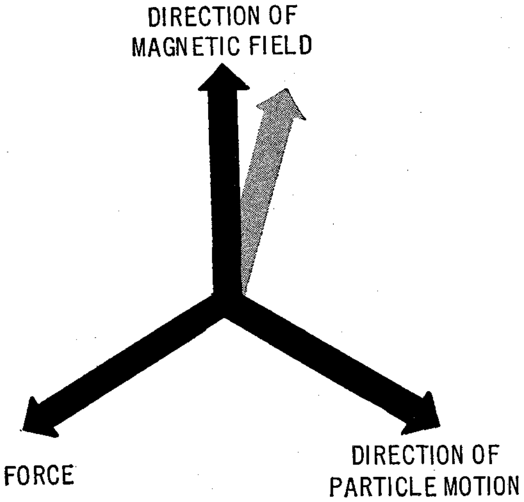

Figure 1. Fleming's Motor Rule

The invention in question was conceived by Ellsworth Edling and myself in 1961 as a method of utilizing the energy of radioactivity which didn't suffer from the usual Carnot-cycle limitations. The theory of its operation was explored and, in due course, a patent application was filed on it. Since the device made use of the kinetic energy of charged particles—*any* source would do, but the invention was conceived with radioactive nuclei in mind—via a direct motor action, it was called originally an atomic motor. The name "charged particle motor" more accurately describes its basic method of operation.

The principle of the device is actually a direct application of Fleming's motor rule, the so-called left-hand rule, which underlies much of modern electrical technology. According to this principle, which is shown schematically in Figure 1, charged particles moving in a transverse magnetic field are acted upon by a force—the Lorenz force—which is perpendicular to both the direction of the field and the direction of particle-motion.

The motor was designed to utilize

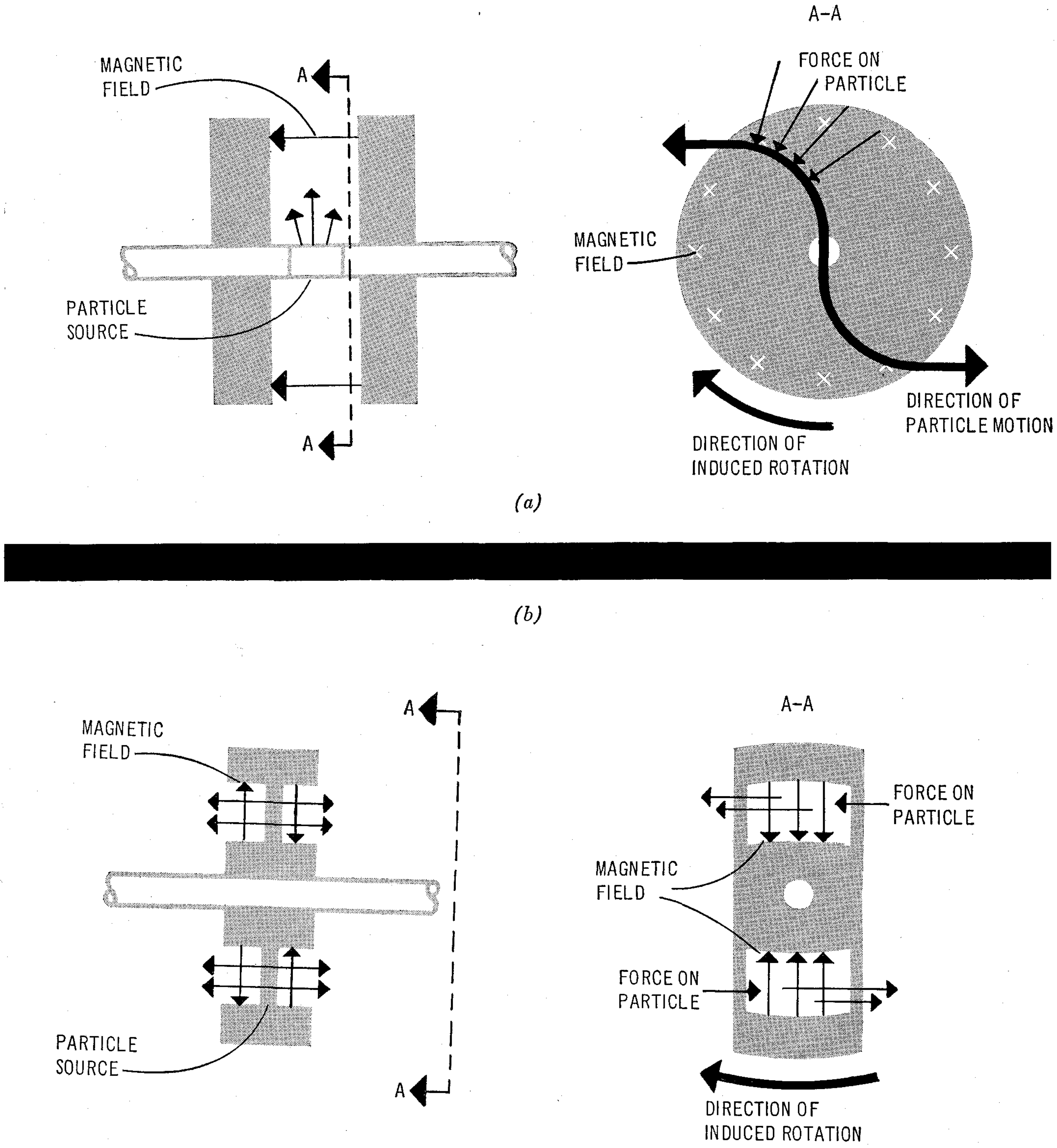
MAGNETIC FIELD
A
A
PARTICLE SOURCE
A–A
FORCE ON PARTICLE
MAGNETIC FIELD
DIRECTION OF PARTICLE MOTION
DIRECTION OF INDUCED ROTATION
(a)
(b)
MAGNETIC FIELD
A
PARTICLE SOURCE
A
A–A
FORCE ON PARTICLE
MAGNETIC FIELD
FORCE ON PARTICLE
DIRECTION OF INDUCED ROTATION

Figure 2. Schematic Configuration of the Charged Particle Motor

a source of charged particles mounted longitudinally in the center of an axial "picket-fence" magnetic field, as shown in Figure 2(a). It was assumed that the particles would all be either positive or negative—easy enough to arrange in practice. They would be emitted radially, the magnetic field would exert a force on them as shown, and they would be deflected in a more-or-less tangential direction. By simple reaction, an equal and opposite force would be exerted on the field and the structure supporting it. If the latter were a properly designed rotor, the force—actually a torque—would produce rotation. This could then either be used directly or converted to electricity by generator action.

Other variations on the same theme are possible. For example, the particle source and the magnetic field could both be arranged radially, as shown in Figure 2(b). The particle motion would then be axial, but the induced forces would still be additive on opposite sides of the axis and the result, again, would be torque.

In all cases, the particles would exit from the field-and-rotor system and be collected on impingement targets.

In practice, of course, there would be problems. Particles are emitted from radioactive nuclei at random, for one thing. Thus, some of them would move more-or-less axially and their torque-producing effect would largely be lost. Furthermore, an actual particle-source would have a finite geometry; therefore, some of the particles would be emitted internally and would serve only to produce unwanted heat in the body of the source. Also, if the source were a radioactive beta-emitter, a considerable particle velocity-spectrum would exist, which could be expected to produce further losses in performance. However, these are only design problems, not fundamental objections.

The actual force exerted in such a particle-field interaction depends on the magnetic field strength, the value of the charge and the velocity of the particle; for any individual particle, it is very small. However, since the number of particles which would pass through the field at any given time could be expected to be quite large in practice, the integrated result—torque per unit time, or power—can be considerable. Without going into details, a somewhat idealized performance equation was derived which would seem to be at least approximately correct:

$$P = \frac{\pi}{4r} Nmv^2 (R_2 - R_1)$$

where P is the power in dyne-centimeters per second, N is the number of particles per second, v is the particle velocity in cm/sec, R_2 and R_1 are the outer and inner limits of the magnetic field respectively and r is the radius-of-turn of the particle's path—dependent on the field strength, the charge, M and v. A further simplification can be made, at least for the case of low-mass, high-speed particles, such as beta particles: $(R_2 - R_1)$ and r can be made approximately equal. As a result, the basic simplified performance equation is:

$$P = \frac{\pi}{4} Nmv^2$$

Insertion of appropriate numerical values into these equations will show that the potential performance of the device would be superior to that of any of the conventional conversion techniques. However, superior or not, the size of the power output is only of incidental concern here. The issue at stake is the existence of any motor effect at all.

The potentially superior performance of the device, in any event, attracted considerable attention among various interested parties and it was evaluated with a view toward exploitation. In the course of these evaluations, an objection was raised to the basic workability of the whole principle. This objection was quite fundamental and apparently valid. Needless to say, it ended any licensing negotiations.

The objection which seemed to unseat the device so unceremoniously can be summarized briefly as follows: when charged particles pass through a transverse magnetic field, it is well-known that they change only their direction and not their speed. Thus, in the present case, although they're turned through some positive angle, the particles exit from the magnetic field still possessing their full original quota of kinetic energy. In short, they're still free to do the same amount of work that they would have done had they never passed through the magnetic field at all. Therefore, if any work is done by the particles on the magnetic rotor, the conservation of energy will have been violated—and upon the conservation principles, of course, hang all of science and technology. Thus, it was stated, no work can be done on the rotor—in other words, the device can't work.

The further logical extension of these arguments, however, creates more problems than it solves. It will be found, in fact, that the entire objection is self-defeating. For one thing, if the turning force produced by the magnetic field on the particles does *not* result in an equal and opposite reaction force on the field—causing torque in this case—then what has happened to the third law of motion? The latter is fully as sacrosanct in science as is the conservation law.

Thus, an extraordinary situation has arisen: the invention *cannot* work by virtue of one basic law, yet it *must* by virtue of another. Obviously, something must be wrong.

The only alternative to this would seem to be that the *objection* to the device must be incorrect. Inasmuch as the core of this objection is the constant-speed particle characteristic, the obvious question must now be asked: does the particle speed *actually* remain constant during the particle's

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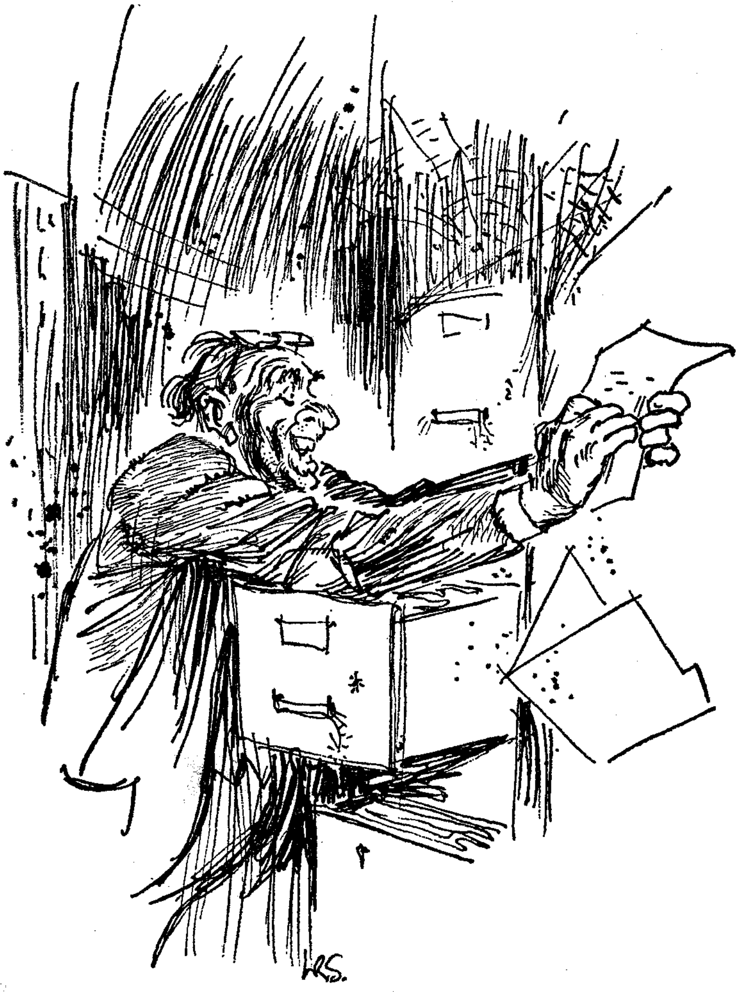


Illustrated by Leo Summers

The Iceman Goeth

Laws are made for normal,
expected situations—and can be savage tyranny
when the completely unexpected crops up.
What, for instance, constitutes
adequate motivation for killing someone . . . ?

J. T. McINTOSH

Among the cobwebs in the War Department, something moved creakily. It was black and angular. it was Horace Phelps.

The War Department hadn't been active for nearly fifty years. At the conclusion of the war with Seben, Axtel's War Department in Garthmoor had become, in effect, a museum, a secret museum to which nobody, except the few remaining War Department employees, was ever admitted. This was no great hardship, since nobody ever particularly wanted to enter the War Department.

At the end of the war with Seben, forty-eight years ago, it had been quite clear that no war would ever be waged with Seben again—and there was nobody else to fight with, not within a dozen light-years. The Axtel War Department had then become rather like a railroad restaurant after the depot closed.

Today, however, there was unusual excitement in the War Department. Phelps was tottering about gleefully, a yellowed slip of paper clutched in his hand.

"This," he said triumphantly, although he was alone except for green filing cabinets and spiders, "shows the absolute necessity of filing everything in quadruplicate!"

What he held in his hand was an order for the location and immunization of an unexploded bomb believed dropped in the Garthmoor area on the night of October 17, 2229—forty-nine years ago.

"Quadruplicate!" Phelps crowed in glee.

Two of the original copies, presumably, had gone to bomb-disposal units. One had been lodged at a field office. All three must have been destroyed. Had the order ever been carried out, the bomb file would have carried a report.

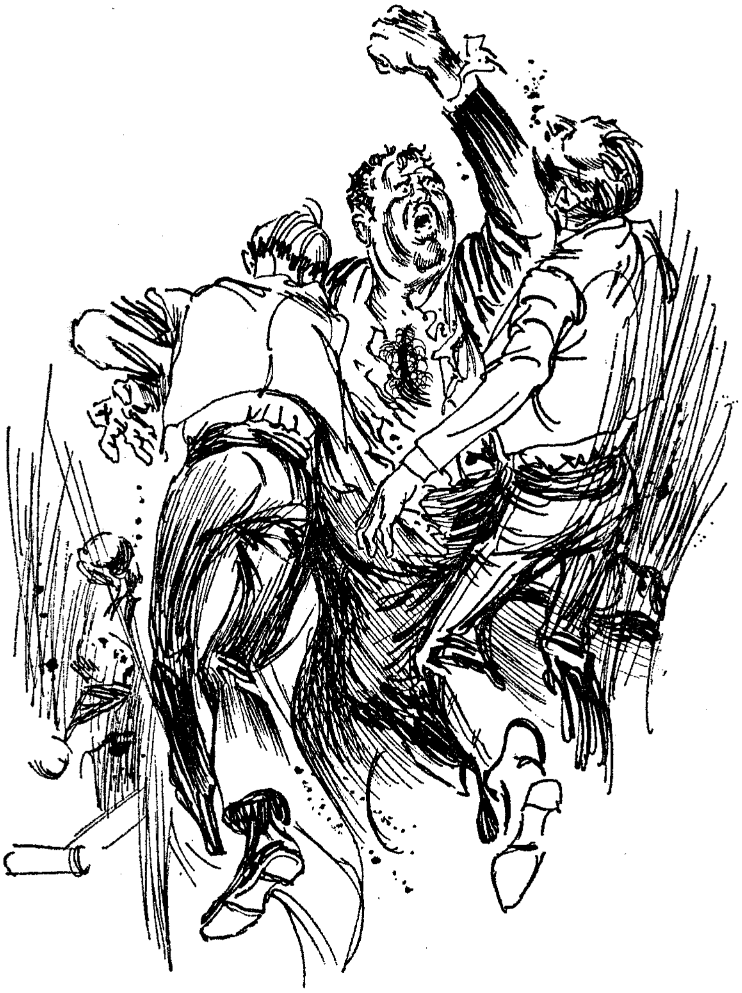
Since there wasn't any report, there was an unexploded bomb somewhere in the Garthmoor area.

The bomb might be a huge one capable of blowing half Axtel to pieces, even after fifty years. It might yet destroy Garthmoor and everything in the city, including Horace Phelps. Phelps in his triumph wasn't thinking of that, however. His delight was because he had discovered something important in the War Department's files, something which nobody knew about, something which would shake the whole world.

Even in his exultation, however, he didn't go off half-cocked and immediately shout his news from the rooftops. The War Department's reputation for precision and infallibility—a reputation which existed only in Phelps' mind—must never be imperiled by any hasty, panic-stricken announcement, especially by a senior official. When the War Department spoke, it should be with lungs of leather, a voice of brass, and the infallibility of God.

So Horace Phelps, instead of recklessly telling anybody that there was a bomb still hidden somewhere under the soil of Garthmoor, Axtel's biggest and most important city, wrote a letter to the War Department of Seben. He asked Seben's War Secretary to confirm that an atom bomb had been dropped on Garthmoor on October 17, 2229.

Having done this, Phelps settled back patiently to await developments, happily conscious of having done the right thing. He'd probably get Seben's reply in about three weeks.



In all the streets round The Golden Fleece, soft seductive whispers could be heard: *"The Golden Fleece. Meet me at The Golden Fleece."* And tantalizing pictures of gorgeous dancing girls flicked across the retina and were gone. The ads were beamed at everybody in the streets except drivers of cars and trucks—it was illegal to distract them.

The night spot had all the charms of Circe. The soft voices became more insistent as you approached the neon frontage of the club. *"The loveliest girls in Garthmoor are here."* The fleeting glimpses of dancers in glittering costumes became clearer, more startlingly real.

Everything that 3D ads could do to convince at least the male passers-by that The Golden Fleece was an Oriental heaven was done.

But inside The Golden Fleece there was unheavenly trouble. A large, fat man suddenly, for no apparent reason, ran amuck and kicked over every table he could reach. Three waiters who threw themselves on him were sent spinning. He seized a champagne bottle and tried to hit a screaming woman over the head with it, but instead hit a lamp overhead, and two tables were splashed with champagne and broken glass. He began to tear his own clothes, and as he did so two experienced attendants got a strait jacket on him.

Order was quickly restored once the shouting, struggling madman had been dragged out of sight. Tables, covers, food and broken glass were whisked away and almost instantly fresh tables were being set. The men and women in evening dress accepted the situation philosophically. Such incidents were not uncommon here.

The manager of The Golden Fleece, Sam Usher, rushed to the dressing rooms backstage and banged impatiently on Andrew Coe's door. "Get on right away, Coe," he called. "Dementia case. Any act you like, so long as you go on now."

Andrew Coe himself opened the door. "I'm ready," he said. His voice was flat, indifferent.

"Good. I'll tell the bandleader."

Coe went back into the dressing room. His assistant, Sandra Silver, was half into spangled tights. "Zip me up," she said.

Coe did as he was told. He and any girls he had in his act invariably shared a dressing room. There wasn't much space backstage at The Golden Fleece, and it was quite unnecessary for Sandra to have a room of her own. She had found that out long since.

From a distance it didn't show, but close examination revealed that Coe was an iceman. His face was as dead as a doornail, and his eyes were deader. He looked exactly what he was, a man with no emotions.

It was the logical, humanitarian way to treat capital offenders—freeze their emotions permanently so that they become incapable of further crimes of passion. A remnant of the emotion of self-preservation had to be left—that kept icemen alive, made them eat, drink, take exercise and avoid physical harm to themselves. Otherwise they cared so little about anything at all that Andrew Coe could share a dressing room with Sandra, and it didn't matter.

"Ready?" said Coe. Already he could hear the band playing his theme music. She nodded, and they went out together, he in black evening clothes, she in sparkling green and not much of it.

There was only spattered applause as Coe came on and the lights went down. His was the kind of act which worked up to a climax, which worked his audience up to a climax.

First Sandra went among the tables, holding up objects which she borrowed from guests. Coe, his back to the audience, identified them without the slightest hesitation.

The applause remained unenthusiastic. Trickery would be easy. But in a little less than a minute, Coe had a firmer grip on his audience. Sandra had a dozen people stand up, and as the spotlight picked them out rapidly, one by one, Coe gave their names. The obvious bewilderment of the subjects, some of whom had never been in the night club before, was impressive and convincing, and this time the applause was louder.

As Sandra went offstage to change her costume, Coe increased the pace still more. Scarcely pausing for breath, he detailed the contents of men's left-hand pockets and women's handbags. He ranged over the audience so quickly, so widely, that soon nobody was able to doubt that he could somehow "see" into pockets or handbags. He could not have that many stooges.

In this part of his act his unemotional manner paid off handsomely. Most clairvoyants, real or fake, gambled heavily on drama. They acted as if everything they did took a great deal out of them, hesitating, concentrating, trancing, sweating. By contrast Coe made everything look laughably easy.

The applause this time, though louder, was still slightly hesitant. Skeptics were wondering how it was done, still suspecting a trick. There was whispering as some who thought they had at least part of the answer passed on their conclusions to others.

Coe didn't mind the whispering. He didn't mind anything. He wouldn't have minded in the least if someone had jumped up and shouted that he was a fake, though he wasn't.

All that any iceman could possibly object to was an attempt to kill him. And even then there would be no anger. No iceman knew what it was like to be angry, any more than he knew what it was to be happy.

Sandra emerged to help Coe in his last item, and attention immediately switched to her. Although the audience didn't know it, the brevity of her red costume, miraculously exceeding that of the green tights, was part of the act, involving the only particular in which it was faked.

She found an obviously genuine volunteer, put him in a booth with a lamp, a pen and paper, told him to write anything he liked, and closed the booth. Elaborate safeguards showed that nobody could possibly see into the booth, that nobody could possibly know what he wrote but himself. Then, standing at a blackboard, Sandra proceeded to write precisely what the volunteer inside the box was writing.

This item was half a swindle, although Coe was genuinely reading what was being written inside the booth. Experimentation had shown that when he wrote on the blackboard himself the effect on the audience was far less than when Sandra did so. The placing of booth, Coe and blackboard gave a visual impression that Coe was reading what was going on inside the box and transmitting mentally to Sandra.

So he was, but not by telepathy. Sandra was no telepath. Her bra was cunningly designed to reveal so much that no one was likely to suspect that what it did conceal included a tiny receiver. This picked up Morse sent by the key under Coe's big toe. Long and short twinges against her flesh gave Sandra the message.

When the volunteer was brought out from the booth he read what he had written, and there was thunderous applause. Coe's act was very popular at The Golden Fleece. It should be: he was the only genuine clairvoyant in show business.

Coe and Sandra took their bows and went out together. But Sandra didn't accompany Coe to their dressing room. She stopped at Sam Usher's office. Coe went on, unconcerned. Nothing pleased or displeased him, nothing bored him, nothing interested him. If his stage assistant was

Usher's mistress, that was less than nothing to Andrew Coe.

Icemen just didn't care.

Police Chief Morris frowned at the figures in front of him. "You don't still believe that all these cases of sudden homicidal insanity are just a statistical freak?"

Inspector Borgman said nothing. He believed just that.

"Hell, Borgman, twenty people a month going homicidally crazy can't be explained by any freak of statistics. There's got to be a reason, and we've got to find it."

"Reason, chief? What kind of reason could there be?" Borgman asked.

"Well, just guessing—suppose a vice ring were using some kind of undetectable mental distortion? There is such a thing. It's called radio . . . radio . . . hell, anyway, it's some kind of mechanically induced insanity."

Borgman was not very imaginative. "Why would anybody do that? What good would it do them?"

"I don't know," Morris retorted irritably. "To create a lot of new drug addicts. To make people gamble. To throw a smoke screen round their own activities."

Borgman said nothing again, obviously unconvinced.

"It must be something," said Morris even more irritably. "Look, when a murder's committed in any town on Axtel, but Garthmoor, the murderer turns out to be sane nine times out of ten, or at least scarcely detectably psychotic. When a crime's committed here, nine times out of ten the criminal turns out to be violently insane, a new madman since yesterday, a guy with a perfectly normal, respectable, honest life behind him who suddenly cut his wife's head off or kicked his mother to death. You don't have to detect killers, Borgman. You just have to go out and put a strait jacket on the guy who's going for everybody in sight with a meat cleaver."

Borgman nodded. "Usually. But the psychologists say that Garthmoor, having the highest tensions of any city on Axtel, naturally has the most nervous breakdowns."

"The psychologists always have what they call an explanation. How come Garthmoor has tensions that Averne doesn't have? Why don't people in Averne suddenly go crazy and destroy everything within reach? Why doesn't Averne have a crime wave like ours? Why were only two women strangled and mutilated in Soberville last month while in Garthmoor, one and a half times the size of Soberville, there were forty-seven?"

He stabbed a finger at the papers in front of him. "Heredity doesn't explain it. Environment doesn't explain it. Immigration doesn't explain it—"

The phone bell rang. Morris picked it up. As he listened, he rolled his eyes at Borgman.

"Two children cut into strips," he said at last, dropping the phone in its cradle. "One of them still alive, but he can't last very long. You'd better get over right away. One two seven Burwash Boulevard.

"And the killer?"

"You needn't worry about him. The neighbors have

battered his head in. It's one of the cases I was talking about, Borgman—a typical Garthmoor case."

When Borgman had gone, Morris' thoughts were anything but serene.

Radio interference with the proper functioning of the human brain was possible, had been possible for a long time. It could even be undetectable. Similarly, poison had been known for a long time. Yet cities' reservoirs weren't often deliberately poisoned—and radio madness wasn't often broadcast indiscriminately.

If there really was radio interference with human sanity going on in the Garthmoor area, why? By whom? Since when? And how could it be stopped?

Three weeks after the date of his own letter, Horace Phelps received a formal reply from the Sebenese War Department. The writer begged to inform him that his esteemed query had been received and that the matter was receiving due attention.

Phelps nodded approvingly. If he had been the Sebenese War Secretary he would have written in exactly those terms. Things were always matters, and they always received due attention. Afterwards whatever there was to tell, if anything, was communicated through the usual channels.

It would have been shocking, indeed horrifying, if the Sebenese War Secretary had simply told him what he wanted to know the moment he asked. That wasn't how these things were done.

The nurse was not pretty nor even particularly clean.

"Police?" she said suspiciously. "Morris?"

"Police Chief Morris. I have an appointment with Dr. Gillan."

"Why didn't you say so, then? This way."

Morris didn't like what he had seen so far of the Garthmoor City Asylum. He was puzzled, too, by its smallness. On an average, twenty men and women found unfit to plead were sent to the asylum every month. This had been happening for the last seven years at least. Two hundred fifty a year, nearly seventeen hundred in the last seven years—from the criminal courts alone. Yet the dimensions of the asylum made it hard to believe there were more than a hundred inmates.

Dr. Gillan was small, cheerful, affable. "To what do I owe this honor, chief?" He asked, extending his hand.

Morris took it. "Frankly, we're at our wits' end, doctor," he said. "I believe that our crime wave is caused by radio madness. What's your opinion?"

"Radio interference? By whom?"

"I've asked myself that, doctor, and can't find any answer. I'd like to leave that question hanging. Do you think there could be radio jamming of human minds in Garthmoor?"

Dr. Gillan placed his hands together as if about to pray. "The correct term is radiopsychosoma," he remarked. "Popularly, radioneurosis. I'm afraid, chief, it's quite impossible to tell. As you may know, the most successful form of radiopsychosoma is the one in which a simple, at the moment undetectable, radio stimulus touches the trauma centers of an individual. The hellish thing about this process is that the brain itself then does all the rest, so that naturally it's difficult if not impossible afterwards to detect anything but the fact of mental breakdown."

"Can you put that a little more simply, doctor?"

"Yes, I think so. A certain stimulus is broadcast indiscriminately. It cannot be picked up by a radio receiver, being intended for reception only by the human brain. When received by the human brain, it forms no pictures, it merely touches the deep-seated trauma centers."

"And then what happens?"

"Often, nothing. In ordinary life many things trigger our trauma centers, and if we are normal, well-adjusted people we merely experience a moment of irritation, depression, pain, apathy. But in the case of less well-adjusted people, or if the stimulus is stronger or more persistent, breakdown may occur."

"Why?"

Gillan unfolded his hands and looked at them with mild interest, as if he had always known he possessed them but had never happened to look at them before.

"In our trauma centers," he said thoughtfully, "are the records of our birth, our most severe accidents, illnesses, operations, failures. All the most highly charged emotions we have ever experienced are there. Stab at that bank by hypnosis, drugs, brainwashing or radiopsychosoma, and . . . who knows? Maybe nothing happens. Or perhaps everything comes flooding out, the patient can't handle it and goes mad."

"And if this happens, you can't say after seeing the patient whether the cause was radioneurosis or not?"

"No. You see, only the stimulus is radioneurotic. What happens to the patient subsequently *he does himself*. Touching a man's trauma center can't make him insane, any more than tickling a man's feet can kill him. But if you tickle a man's feet when he's balancing on his hands on the edge of a precipice, he may well fall over the edge. And if you interfere with a man's trauma centers, he may just as easily turn to madness to escape."

Morris nodded. "And now, doctor, quite off the record —do you think the reason for the large number of insane people sent here may be radioneurosis?"

Gillan smiled without mirth. "How should I know? I've already told you it's impossible to tell."

Morris recognized finality when he heard it. Whether Gillan had an opinion on the subject or not, he wasn't going to give it.

There was still another thing about the Garthmoor City Asylum, however, which interested Morris.

"Doctor," he said, "how many patients have you here?"

"About ninety-seven."

"Is there an annex somewhere? Do you farm out patients?"

Gillan looked at him keenly. "No," he said. "All the incurable homicidal maniacs of the city of Garthmoor are here."

"But—"

"Can it be that you don't know? The city's Police Chief? Morris, the average patient admitted here is no more good to himself than to anyone else. To stop him taking his own life we'd have to keep him permanently immobilized. Well, we don't."

"You mean—" Morris breathed.

"The senators, the secretaries all know about it. I'd have thought you would, too. How could the city of Garthmoor maintain three thousand highly dangerous lunatics who would kill themselves or anybody else, given a chance? With another twenty coming in every month? It's impossible, Morris. I'd need a staff of five thousand to restrain them, force-feed them, wash them. They're quite incurable, you know. We never help them into the next world, Morris. We simply let them go."

As he left the asylum Morris was oppressed for perhaps the first time with the real urgency of the situation.

It was not merely necessary to do something. It was vitally necessary to do something damn quick.

Andrew Coe slowly and carefully changed from casual clothes into his black stage suit. He was due at The Golden Fleece in an hour, at ten o'clock, for the first show of the evening.

As he dressed, his thoughts were calm but not serene. Serenity could be achieved only by someone who had emotions to transcend. Coe had none.

He thought mostly of his night-club act, for money was self-preservation and the better the act the more money he would have. The fact that he could live out the rest of his life at his present standard of living on his present bank balance was unimportant. Since there was no aim, no goal in his life except self-preservation, he thought and lived merely for the cabaret act which was his job.

The part of the act where he rapidly named a dozen strangers always went down well. His present telepathic rating wasn't high, not nearly as high as his ability in clairvoyance. But naming strangers was pretty easy. He usually said to the first: "Your name is—" and gave the name after only the briefest of pauses. It was strange that the audiences never realized how easy it was. His subject, led in this way, couldn't help mentally screaming his own name, and anyone with the very slightest telepathic ability had no difficulty in picking it up. The subsequent subjects were even easier. Once his attention was turned on them, they thought of nothing but the name he wanted. Even if they tried to substitute another name, the real one carried such a heavy charge that there was never any difficulty.

What else could he do along the same lines? Tell people whether they were married or single, perhaps. How old they were. How many children they had. The names of their husbands or wives.

Yet a detailed mind-reading session with one person was much less effective, Coe knew from experience, than the quickest, most casual contact with at least a dozen. People were skeptical, suspicious of faking. If a man was told his own name, he was much more impressed than if Coe conducted a masterly telepathic examination of somebody who might be a stooge.

So perhaps the best thing was to find further ways of briefly contacting as many as possible of his audience. Suppose he showed three colors and asked everyone to pick one. It wouldn't take long to point out all the people who had picked the first, and then all those who had picked the second, leaving those who had chosen the third to be established by elimination. That might be impressive—without wasting too much time he'd have shown that he could read every mind in the audience.

Or he could have Sandra show the audience three different—

Coe's thoughts stopped dead. For a moment he hesitated, as if listening. Then he rapidly finished dressing.

Fifteen minutes later he was at the block behind The Golden Fleece. It was being demolished to allow a new block of apartments to be erected.

It was quite dark, for Axtel had no moon. Although Coe had brought an electric torch with him, he didn't use it yet. His clairvoyant gift was better than radar. In the total blackness he climbed surefootedly over the rubble, seeing it mentally.

He didn't switch on his torch because he knew that at that time and that place he was liable to be tapped for the contents of his wallet if he were seen. His clairvoyant sense told him that, although there was nothing living in the demolished block, there were plenty of prowlers in the surrounding streets.

At one point a stairway remained. Coe climbed it carefully, well aware that there was a wall on one side only. He reached the second floor, found a door that swung idly, and entered what was more or less a room, except that its four walls were open to the black sky.

Then at last Coe pointed his torch down and pressed the button.

At his feet lay most of Sandra Silver. She was no longer a beautiful showgirl. She was, indeed, a particularly repulsive object, through no fault of her own. Fortunately she was exceedingly dead, although there were signs that she had taken some time to die.

Coe put out the light and retraced his steps. It hadn't been really necessary to go and see that Sandra was there; he had known she was from the moment that he thought of her in his bedroom. There had been, however, a faint possibility that she was still alive. His telepathy didn't work very well at that distance, and clairvoyance merely established where she was and that she was quite motionless.

He phoned the police from The Golden Fleece.

Borgman was uncertain, out of his depth, though his manner remained as bluntly assured as ever. He knew all about icemen, but it was not to be expected that he'd accept any clairvoyant or telepath at face value.

"You say you *knew* she was there?" he said stolidly.

"Yes," said Coe.

"Why just then? Her body had been there more than twelve hours. Why didn't you *know* before that she was there?"

"Because I didn't think about her." Coe stopped, regarding the explanation as sufficient. When he saw it wasn't, he went on patiently: "Suppose you suddenly think your wallet's been stolen. You feel in your pocket. It may have been gone for hours, but you didn't know because you didn't think of it, you didn't look. Any time I'd thought of Sandra in the last twelve hours or so I'd have sensed something strange, and followed up the thought, and discovered where she was. But I had no particular reason to think of her."

Borgman grunted. "She was your partner? You don't seem concerned over her death."

"I told you, inspector, I'm an iceman."

"Why were you sentenced to be made an iceman?"

"I killed a girl."

"Yet you weren't insane?"

Coe said nothing. It was unnecessary to say anything.

There were crazy killers, unfit to plead, and there were sane killers. The insane killers were sent to Garthmoor City Asylum, and nobody ever saw them again. The sane murderers became icemen. Obviously, since Coe had been made an iceman, he had been regarded as sane, had been tried, found guilty and sentenced. Since Borgman must know all that perfectly well, Coe found it quite unnecessary to answer.

"You were clairvoyant before you were sentenced?"

"Of course. My clairvoyant powers were considerably greater then."

"Why is that?"

"Clairvoyance and telepathy depend partly on sympathy, on empathy, on emotion. I retain the nonemotional part of my talent. The greater part is lost with my emotions."

Borgman grunted again, not quite sure he understood that. He turned back firmly to facts.

"This girl you murdered—why did you do it?"

"She was unfaithful to me."

"How did you know?"

Borgman could have bitten out his tongue after asking such a fatuous question. But Coe, being an iceman, didn't make any cracks, didn't smile, merely answered patiently. "I am clairvoyant, Inspector Borgman."

"Being a clairvoyant and a telepath, can you tell me who murdered your assistant?"

"No."

"Why not?"

"Because my mental attention was otherwise occupied at the actual time when Sandra was murdered. Because I only have part of my powers. If I had the empathetic side of my psionic powers, I'd be able to—"

"Quite," said Borgman. He didn't want to pursue that line. "This Sam Usher, the manager here—I understand Sandra Silver was his mistress?"

"I understand so," said Coe indifferently.

"Did he kill her?"

"No."

Borgman hadn't expected such a definite answer. He wasn't quite sure of his own attitude toward Coe. Still faintly suspicious of him, still not a hundred per cent certain he wasn't the killer, Borgman nevertheless knew perfectly well that no iceman could possibly kill anybody except in self-defense. He also knew that no iceman could lie. That was why capital criminals who were pronounced sane were treated in this way—they could be allowed to go free, less likely to commit any crime than people who had never been criminals at all.

Borgman couldn't help being impressed by the way Coe had found Sandra's body before the girl had been missed. So there was a possibility that Coe's comments on the case might be valuable.

"How do you know Usher didn't kill Sandra?"

Coe shrugged. How did you know blue was blue?

"Could you find out who killed her?"

"Perhaps."

"How?"

"I could mentally investigate all the employees of The Golden Fleece in turn. There are forty-six, counting the band, the kitchen staff, barmen, electricians, waiters and cigarette girls. If one of them has become homicidal, I'd know which one."

"You think the killer may be an employee of the club?"

Again that irritating shrug. A silly question didn't get a silly answer from Coe: it got no answer at all. Coe had said "Perhaps." *If* the killer was an employee of the club who had suddenly gone insane and murdered Sandra, Coe could find out who. What was the point in asking him if he thought the killer might be an employee of The Golden Fleece?

"Wait," said Borgman in sudden decision.

Sam Usher stood up quickly, anxiously, as Borgman entered his room. Usher was a small, thin, sandy-haired man, not the type to have a showgirl mistress if he hadn't been the boss. Apparently he, not Coe, hired Coe's assistant.

"Yes, inspector?" said Usher nervously. "What can I do for you? This is a terrible thing—"

Borgman surveyed him thoughtfully for a few seconds. Usher wilted under his gaze. Borgman shrewdly suspected that Usher had quite a few excellent reasons to be anxious about a police investigation, and that the last thing he craved was to be interviewed by a police inspector. For that very reason it seemed unlikely that Usher could be the killer, even apart from the fact that the murder had all the signs of being the work of a maniac.

"I want a list of the employees of this place," said Borgman. "Everyone. Including you."

"Certainly, inspector. We keep a list up to date. Here you are." Usher seemed relieved that that was all.

"Thank you."

Borgman took the list to Coe's dressing room and thrust it into Coe's hand. "There you are. Go through that list and find the killer."

Coe took the list. He read the names slowly, patiently, pausing after every one as if to listen.

After reading twenty names or so he passed the list back to Borgman.

"Drake Kerr, electrician," he said. "I don't guarantee he's the murderer, but you might like to investigate, inspector. He's lying in his bed at home with his throat cut. The razor's still in his hand."

The interplanetary radiogram, third class, addressed to Horace Phelps at the War Department, Garthmoor, Axtel, stated that a letter had been mailed to him that day. L. Pumphret, War Secretary, Seben, trusted that the information enclosed therein would prove to be of value to Axtel's War Department.

Phelps rubbed his hands with satisfaction. With luck, the Sebenese War Secretary's letter would reach him in less than two weeks.

"This is your new partner, Coe," said Usher. "For the time being, anyway."

Anyone other than an iceman would have noticed a slight interplay between Usher and the new girl. It would not have needed much intelligence or imagination to guess that they had already had a difference of opinion, and that the girl was being warned to change her mind or else.

Coe noticed nothing, naturally. He glanced at the new girl merely so that he would know her again. It was of no interest to him that her thirty-six inch bust and hips were rendered slightly sensational by a genuine nineteen inch waist. He noticed she had dark hair but paid no particular attention to her perfect features.

Sandra Silver had been dead nearly a week and the police case was closed. It was a typical case. Drake Kerr, a quiet, well-behaved young electrician, had suddenly become insane, murdered and mutilated Sandra, and then gone home and killed himself. It had been established beyond doubt that the razor he held clutched in his dead hand was the one which had slit Sandra open.

Kerr had saved Dr. Gillan of the Garthmoor City Asylum the trouble of entering his name as a patient. Kerr had done everybody a favor by killing himself with commendable promptitude. End of case.

Borgman had departed still doubtful and uncertain about Coe, but with a grudging respect for his abilities. If, as Borgman still believed deep down, Coe was some kind of a fake, he was a very clever fake.

"You'd better go with Mr. Coe now, Dawn," Usher said coldly. "You share a dressing room with him."

"Now listen," said Dawn firmly. "You already tried to sell me this job on conditions, and I thought I made it quite clear that, although I do want this job, I'm not going to—"

Usher whispered to her, unnecessarily, for Coe would neither resent nor be hurt by anything which was said about him, and pointlessly, because if Coe wanted to know what was being said, whispering wouldn't stop him. The brunette nodded reluctantly, apparently convinced of nothing except that if she wanted the job she'd have to share a dressing room with Coe.

"Why do you call yourself Dawn Day when your real name is Mary Stubber?" Coe asked as they entered the star room.

The girl was startled. So he really was a clairvoyant. "Stage name," she said.

Coe said no more, nothing being necessary.

Within the next few minutes she knew a little more about icemen. It was not merely that Coe didn't look at her—that might have been due to gentlemanly feelings. It was rather that after a few minutes in his company she sensed the absolute blankness in him where other people kept their feelings. There would have been more warmth in the company of a cat.

When Coe did speak, it was merely to tell her what he expected her to do in the act that evening. There being no opportunity for rehearsal or training, this was very little. He'd have to carry the entire act himself for a day or two.

Dawn's curiosity got the better of her. "How long have you been an iceman?" she asked.

"Four years."

"Don't you mind it?"

"I don't mind anything."

"Wouldn't you like to be a . . . a normal man again?"

"No."

"Could you be made a normal man again?"

"I could be, but I won't be."

"What did you do?"

"I killed a girl."

"Why?"

"She was unfaithful to me."

Dawn shuddered. It made her flesh creep to hear him say "I killed a girl" and "She was unfaithful to me" as if he were saying "It was raining."

For a moment she asked herself if she really wanted the job after all. But only for a moment. She wanted it all right—the fact that she wasn't entirely sure of her motive didn't make it any less strong.

Nevertheless, as Coe adjusted for her a costume she could hardly fix herself, and she felt his cool, entirely sexless hands on her bare skin, she found herself shuddering again.

It was like being touched by a snake.

Horace Phelps tore open the envelope eagerly and scanned the letter inside. A few seconds later he was stamping in annoyance.

He had been quite certain that it would turn out that a vast, powerful bomb lay quiescent, but not dead, somewhere in the Garthmoor region. He would report it, there would be tremendous consternation, and the War Department would once more get due recognition. To do him justice, Phelps was less concerned about personal fame than recognition for his beloved Department.

The letter was a bitter disappointment. Eleven atom bombs or rockets had been dropped in or fired at the Garthmoor area during the war fifty years ago. All these Seben could account for. The Axtel Navy had exploded seven by bombdamp, a force-field technique which released the main force of the explosion away from gravity. Two had exploded more or less as planned, but in both cases local force fields had partly damped out the blast and wholly absorbed the radiation. Two had failed to explode and had been dismantled by Axtel bomb disposal squads.

At this point the Sebenese War Secretary remarked courteously that all this would be known to the Axtel War Department—as, of course, it was. What Phelps was interested in was the bomb he *didn't* know about.

This could only be the dementia bomb released on October 17, 2229, the letter went on. This presumably had failed entirely, or Garthmoor would have known all about it long ago. It was designed to affect any human brain within a radius of ten miles by the radiopsychosomatic process.

The letter closed with expressions of good will which Phelps hardly bothered to read. It was hardly worth the trouble of reporting this to . . . well, who was the proper authority to be told about a so-called dementia bomb? The Ministry of Health? A hitherto undiscovered atom bomb would have been a big story. This feeble squib of a dementia bomb that didn't work wouldn't interest anybody.

All the same, he'd better report it. To the police, he decided. He sighed and began to draft his letter.

He had so wanted it to be an atom bomb.

Phelps would have been surprised and gratified if he had been privileged to see the effect which his letter produced on Police Chief Morris. "That's it!" he shouted, as Archimedes had once shouted "Eureka!"

Inspector Borgman stared at him very much as the Greeks must have stared at Archimedes.

"We've got to find that dementia bomb at once and immunize it," said Morris.

"But the letter says—"

"I know the letter says the bomb must have failed. But we know it didn't. We know it's been causing our crime wave."

"Do we, sir?"

Morris spoke more to himself than to Borgman. "Radiopsychosoma, Dr. Gillan called it. But he couldn't see why anybody should try to do such a thing to Garthmoor. Neither could I. Neither of us thought of a fifty-year-old bomb gone wrong."

"Gone wrong, sir?"

"The bomb was dropped fifty years ago. And nothing happened for about forty years. My guess is that the activating mechanism was damaged or destroyed and the bomb lay quiescent until the walls or inner compartments began to corrode. Then it developed a slow leak. Instead of affecting everybody in Garthmoor, its been picking off one here and there. I wonder how we're going to set about finding the thing? If it's been undetected for fifty years, we can hardly expect to find it lying out in the open."

His initial pleasure had already evaporated as he began to realize the difficulties involved. All the normal bomb-tracing methods had been used as a matter of course soon after the war to make sure that the city was clean.

"How are we going to find the thing?" he muttered. "It hasn't turned up in fifty years. That means it's so far underground that—Hell, buildings and streets have probably been constructed on top of it. Where are we going to start?"

"Pardon me, sir, I've got a suggestion."

"You have?" The slight accent on the "you" was hardly flattering, but it was no surprise to Borgman.

"Andrew Coe, an entertainer at The Golden Fleece, is a clairvoyant, sir."

"Oh yes, the Silver case. Coe isn't a fake?"

"I don't think so, sir."

"You mean he even convinced you?"

Borgman looked uncomfortable, but he stuck to his guns. "Even if he's a fake, sir, he might be able to help us by the same kind of trickery."

Morris, having nothing to lose, sent for Coe at once. Coe arrived within the hour, but not alone.

The summons made Sam Usher squirm. He had been vastly relieved when the Silver affair blew over—as Borgman had suspected, Usher had his own reasons for having as little to do with the police as possible.

Now the police requested the assistance of Andrew Coe. Usher was in a spot. He could hardly refuse. Yet Coe was a valuable property, and Usher didn't want to lose him. This seemed quite a possibility: Coe had solved a murder case with the greatest ease, and now the police wanted his help again, Police Chief Morris at that. If this kind of thing went on, Usher could see Coe becoming a special consultant and giving up his night-club act.

Usher would have liked to go along with Coe to keep an eye on his own interests. But for Usher to walk into Police Chief Morris' parlor would be asking for trouble.

So Usher sent Dawn Day with Coe. Both Morris and Borgman looked at her with misgivings.

For her part, she was a little awed by the summons. In the ten days during which she had been Coe's stage assistant she had overcome her dread of him but not her distaste. Having little or no experience of icemen she half thought he must always have been cold and feelingless. In her exuberant femaleness she had no hope of understanding a creature like Andrew Coe.

As a telepath, on the other hand, and even more as a clairvoyant, he was wonderful. She found working with him deeply satisfying. She found it hard to believe that before he became an iceman his powers had been even greater.

"Miss Day," said Morris, "I should prefer to see Mr. Coe alone, if you don't mind."

"But I do mind," she said. On this point she had specific instructions from Usher. "Mr. Usher has a contract signed by Coe. Naturally he wants to know what's going on."

Morris sighed and came straight to the point. "Coe, a Sebenese dementia bomb lies hidden somewhere in this region. It must be well hidden, probably buried and long since completely covered, or it would have been discovered long ago. Can you find it?"

"No," said Coe.

"Why not?"

"Because I don't know what it looks like, I wouldn't recognize it if I contacted it. This buried bomb is completely covered with earth, and it doesn't think."

"In a way it does," said Morris. He explained what he knew of radiopsychosoma.

Coe shook his head. "I can't detect anything like that. You see, I have no emotions."

"What do you mean?"

"From what you say, radiopsychosoma is a radiomechanical means of triggering the deepest, most painful emotions in an individual. I have none. A strong radiopsychosomatic signal might be applied to my brain at this moment, and I wouldn't even know."

Morris leaned forward eagerly. "If you weren't an iceman—if all your faculties were restored—would you then be able to sense this bomb?"

Coe shrugged. "Obviously."

"You're quite certain of that?"

"Assuming all you have told me is correct, yes."

Morris stared at him fixedly for several seconds. Then he said: "Do you want to be restored?"

"Wait a moment," said Dawn. She had specific instructions from Usher on that point, too, and she was honest. Having agreed to look after Usher's interests, whether she liked him or not, she would do as she had promised. And the last thing Usher wanted was that Coe should cease to be an iceman. With his faculties completely restored, he would certainly find something better to do than appear in a cabaret. "Mr. Usher has a contract, as I told you. It was signed on the basis that Coe remains an iceman. Mr. Usher doesn't want—"

"Kindly don't interrupt," said Morris. "Whether a court sentence is enforced or rescinded is a purely judicial matter, and Usher has no rights whatever. Now, Mr. Coe—do you want to be restored?"

"No."

"Why not?"

"I want nothing. The word has no meaning."

"But you could find the bomb if you were restored?"

"No."

Morris and Borgman both jumped. "Just a minute ago you said—" Morris began.

"I said I'd be able to sense it. Whether I'd be able to find it is another matter. If I were restored, I'd sense the radiopsychosomatic signal so intensely that I'd almost certainly go insane immediately. In the circumstances, I couldn't very well find the bomb."

A man could be made an iceman in twenty minutes, but a long and delicate brain operation was required to restore him.

Morris had spent a couple of weeks setting in motion all the other possible ways of detecting and destroying the dementia bomb. Unless, however, a lucky break presented itself, he wasn't too hopeful.

Such a bomb, he knew now, would be designed to bury itself a hundred feet in the ground. It wasn't meant to be easily detected and destroyed—and it was designed to work very well through a hundred feet of earth. It wasn't big, so metal detectors hadn't much chance of finding it. It didn't make a noise, and if the waves it emitted had been detectable the bomb wouldn't have been much use as a weapon.

Short of razing the city of Garthmoor to the ground and digging a hundred feet down over the entire area, it seemed to Morris that his best chance of finding the bomb quickly was through Coe.

So Coe had been taken to Averne, a hundred miles away, where presumably he would be safe from the effects of the dementia bomb under the soil of Garthmoor, and there the operation to make him a normal human being had been carried out.

Not only Coe had gone to Averne. Morris was there. Six cops from Garthmoor were there. And Dawn Day was there. Unable to prevent Coe's restoration, Sam Usher was even more anxious to keep tabs on him.

It was true, as Morris had said, that Usher could do nothing about it. A court sentence had made Coe an iceman. Only a pardon or special emergency powers taken by the police could restore him even temporarily. Usher, who was merely Coe's employer, had no influence he could exert one way or the other.

Indeed, the only hold Usher had had on Coe, the contract, was now void. There was a clause in it stating that the contract was void if Coe ceased to be an iceman. The clause had been inserted for Usher's protection, not Coe's—but now it recoiled on Sam Usher. Coe could walk out on him any time he liked—unless he was once more made an iceman.

Dawn Day called on Coe at eleven o'clock on the first day when he was fit to see visitors. There were two policemen outside Coe's private room at the Averne clinic where the operation had been performed but no one inside except Coe.

He looked up from tying his shoelaces and saw Dawn for the first time. The very first time.

"Well, well," he said. "Could even an iceman stay frozen with you around?"

She looked at him steadily. From the moment she had entered the room she had sensed the difference. She, too, was meeting Andrew Coe for the first time.

"Evidently the operation was a success," she said dryly.

"Oh yes . . . but I can see I'm going to have quite a job with you. The way you think of me—it shouldn't happen to a dog."

Although he didn't move, she found herself taking a step backwards. It wasn't just like meeting a man for the first time, after all. It was like finding that a hitherto blind man could see.

"Maybe not such a job," he added. "Already you're beginning to see me in a different light."

She found herself blushing. "Really, this is impossible," she said, half embarrassed, half exasperated. "If everybody had telepathy, that would be O.K. If nobody had it, that would be fine, too. But when you have it and I haven't—"

"You're wrong there, Dawn. I didn't know before, but I do now. You're not a high-grade telepath, but you could be trained. I could train you."

"Thanks very much. But somehow I think the act is broken up as of now. I got used to you the way you were. I don't think I want to get used to the new Andrew Coe."

He laughed. "It's no use saying things like that, Dawn. I can see right into you. You're drawn to me, and you know it. Not the way an ordinary girl is drawn to an ordinary man, but the way a half telepath is drawn to a full telepath. You didn't know it, but you tried for the job as my assistant because you hoped I was a true telepath—and you hated me for being such a disappointment to you as a human being."

She opened her mouth—but how could you argue with a man who knew not only what you really thought, but also how you really felt?

"O.K., let's make a deal," Andrew said. "No more peeping, at least without warning. How do you do, Miss Day? I'm Andrew Coe."

She smiled mechanically, still feeling awkward in his presence, and yet, as he had said, drawn to him by something more than sexual chemistry.

Soberly he explained to her that although high-grade telepaths were even rarer than gifted individuals in most other fields, there were quite a few half-telepaths like herself, sensitive, intuitive, always looking for something that wasn't quite there, striving for something not quite within their grasp.

"I shouldn't have thrown it at you like this," he admitted. "But you see, I'm not self-contained any more. I'm a lonely freak, and I need someone like you the way you need me."

"I don't need anybody," Dawn insisted. "I never knew I was a telepath, and I've been perfectly content—"

Andrew was laughing. "Honestly, I'm not peeping," he said. "But before I stopped I got quite a lot about you . . . you weren't a showgirl at all before you answered Sam's ad. You worked in a law office. You were doing well, and you'd never had any urge to go into show business. There wasn't a more respectable girl in Garthmoor. What made you suddenly throw up your job and become a night-club entertainer, prancing about night after night in a few sequins and feathers? What made you stay in it even after you found I was nothing but a—"

"All right, don't labor it," she said crossly. "I saw your act one night, and somehow . . . well, when I saw that Usher needed a new assistant for you, I found myself applying for the job, and wanting it so much that I got it."

"Even without the usual conditions."

"You mean . . . Usher?" She shook her head contemptuously. "I can handle men like him."

"Yet he knows he can trust you. You're here to look after his interests."

She shrugged. "He knows I'm honest, that's all."

A little later, when Morris came in, he, too, saw at a glance that Andrew was no longer an iceman. At his arrival, Andrew abruptly became businesslike.

"If I do this job for you," he said, "I want to stay as I am now. I don't do a thing for you until you sign an undertaking that my sentence is revoked."

"A couple of weeks ago you didn't care."

Andrew made an impatient gesture. "Don't be a fool, Morris. Two weeks ago I didn't care about anything. Today I'm telling you that I want a permanent amnesty, or I won't play."

Dawn, looking at him, shook her head as if to clear it. Her two images of Andrew Coe were not yet scrambled. She got a hint of her true feelings towards him, however, when she thought of him becoming an iceman again. Even if she never saw him again, that must not be allowed to happen.

She had forgotten she was present to look after the interests of Sam Usher, who wanted Coe to be an iceman again as soon as possible.

Morris shrugged, not in the least surprised. The man before him now, young and eager and hot-blooded, was a very different proposition from the half-human robot who had spoken with such indifference two weeks before. Perhaps the most significant index of the change in Andrew Coe was the way the girl was looking at him. Nobody ever looked at an iceman like that.

Without a word Morris took a typewritten paper from his pocket and handed it to Andrew. Andrew skimmed through it and looked up, grinning. "You're no fool," he said. "You knew I'd demand this. O.K., I'll find your bomb for you if I can. Maybe it'll turn out to be easy after all."

It didn't. Later that day, in the car speeding back to Garthmoor, Andrew suddenly said: "Hold it. Slow down. In fact, stop for a minute."

The car drew in at the side of the highway. Morris and two of his cops were in the front. Andrew and Dawn were in the back seat.

Andrew was in a strong position and he knew it. He had had Morris sign a blanket release, so that he couldn't be made an iceman again, win or lose—unless, of course, he committed a fresh crime. Andrew was, in fact, a free man, not even compelled to assist Morris to find the dementia bomb unless he felt like it.

The police driver had been warned that Andrew might tell him to stop abruptly. Morris turned round inquiringly.

"I'm getting the message here," said Andrew.

"What, twenty miles from Garthmoor?"

"I don't know how far it is. I only know it's as much as I can bear here."

"What's it like?"

"Strain. Grief. Misery. Uncertainty. Fear. Apathy. Desperation. Pain. Tension. Failure. All that, all at once."

"You won't go mad?" said Morris sharply.

The strain in Andrew's face eased a little and he smiled with an effort. "Not here, no. You see, though I'm much more sensitive to the stimulus than anybody else, I know what's happening and nobody else does. People who crack don't know anything. They just snap. Driver, go on slowly. But be ready to stop, or even to make a U-turn and get the hell out of here."

The car went on at fifteen miles per hour. Andrew took Dawn's hand and grasped it tightly. She watched his face anxiously. With every turn of the wheels, almost, the tension in his face grew.

At last he sobbed. The other four in the car were all startled at the sound. But he said nothing.

Suddenly Dawn spoke. "He can't speak! He can't say anything! Let's get him out of here."

"No," Andrew gasped. "Go on—slowly."

But only a hundred yards further on he had to surrender. The moment he gave the word, the car swept round and sped back, away from Garthmoor.

Andrew recovered about five miles back— almost exactly, Morris noted, at the spot where he had first sensed something.

"This isn't going to work," Andrew said. "I'm not going to get within fifteen miles of Garthmoor unless we can find some sort of a shield."

Morris said nothing. For all he knew, Andrew might have been putting on an act. He might announce soon that he couldn't do anything about the dementia bomb, that he obviously couldn't return to Garthmoor, so sorry he couldn't help, good-by. And the terms of the amnesty would cover him.

At Andrew's request they stopped at a roadhouse a few miles back from the invisible barrier which he could cross only at his peril. He would think of something, he said. He needed time.

But the only thing Andrew Coe did in the next few days was get married.

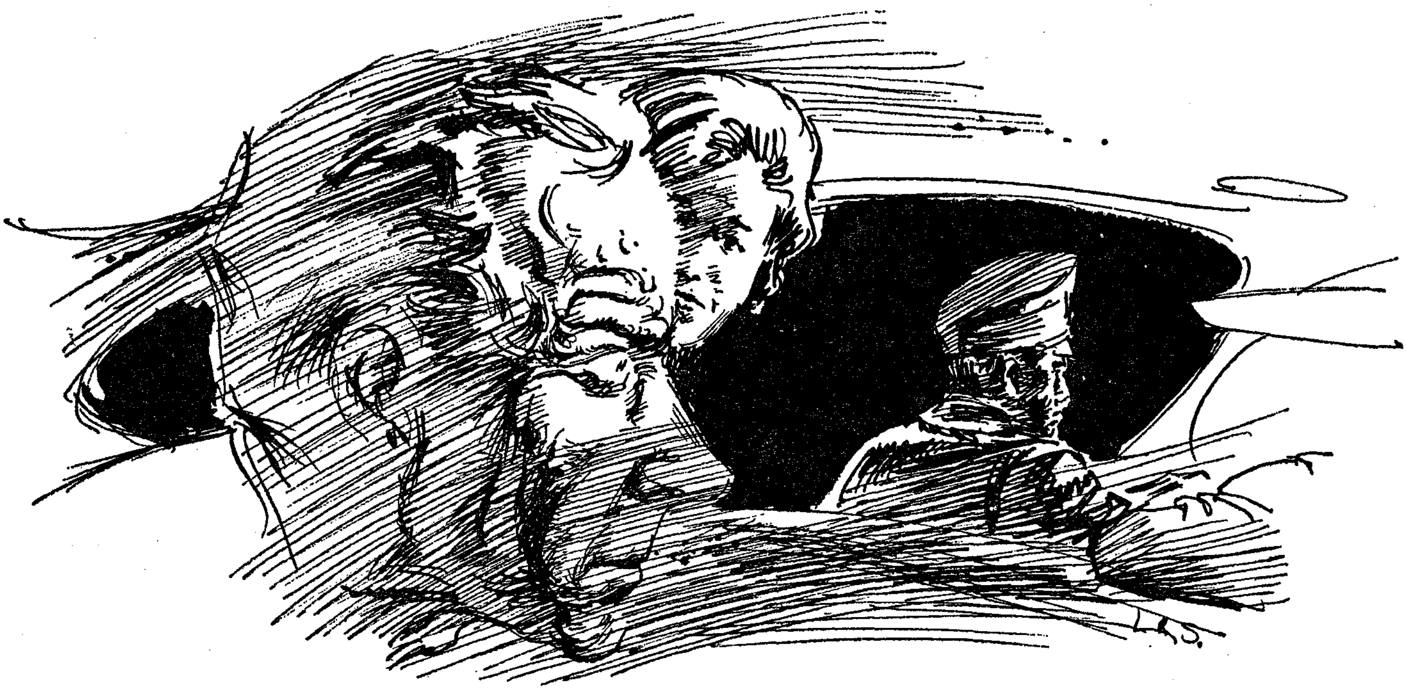
They were days of sheer frustration for Morris.

Dawn held out until it became clear to her that she was only delaying the inevitable. Something that was more than either affection or sex was pushing her and Andrew together.

Any time Morris spoke to Andrew he was told absently: "O.K., inspector. In three or four days I'll have a suggestion to make. You'll just have to wait."

And Morris waited, seething. The daily reports from Garthmoor didn't help his temper. None of the attempts to unearth the bomb were meeting with the slightest success—and the number of radiopsychosomatic cases was on the increase.

When Andrew finally invited Morris to lunch with him



and Dawn, Morris nearly refused. However, he swallowed his irritation and went, and had to suffer a meal during which Andrew and Dawn acted like honeymooners.

At the end of the meal, however, Morris was surprised when Dawn quietly left them.

"I've got an idea, inspector," Andrew said abruptly, "which I think may work."

"I've noticed you working on it," said Morris tartly.

"Oddly enough," Andrew said mildly, "you have, unless you're blind. If you haven't any idea what I'm going to suggest, you can't be very bright, inspector."

Now there was something fresh to irritate Morris. For the life of him he couldn't guess what Andrew was going to suggest.

"All right," said Andrew. "I'll tell you. Dawn has been my stage partner for some time, and she's easily the best I ever had. Unlike any of the others, she has both telepathic and clairvoyant ability. Perhaps not enough to use on her own account, without me. But between us, she and I are pretty terrific."

Morris still didn't know what was coming.

"Look, inspector. She was in Garthmoor only a little over two weeks ago, and she didn't go mad. Apparently despite her telepathic-clairvoyant awareness she can withstand the mental assault of the dementia bomb. Now do you understand?"

"I'm beginning to," said Morris, becoming excited.

"It was about time. I can't go into Garthmoor, not as I am now. But Dawn can. In the last day or two we've been building up ties of every kind—mental, physical, emotional, telepathic, clairvoyant. I'm pretty sure that if you take her into Garthmoor I'll be able to keep constant mental contact with her. I believe that through her I can 'see' the bomb."

Within an hour Dawn left in the car with the two cops. Morris stayed with Andrew. The driver of the car had orders to get clear of Garthmoor as quickly as possible if Dawn told him to. There was, of course, considerable danger for her. Her possession of telepathic ability made her more likely to be an easy victim of radioneurosis than the average person.

Andrew sat in the garden behind the roadhouse, his face becoming more strained and withdrawn with each passing minute. Wisely, Morris said nothing at all.

Idly Morris wondered what Andrew would do now, after the dementia bomb episode was concluded one way or another. With rare talents like his he could more or less invent his own job. He could—

"The car is approaching the outskirts of Garthmoor now," Andrew said quietly.

"Can you see what's happening?"

"No, not in any sense of looking through Dawn's eyes or watching a television screen. But I know what she knows, and more."

"More?"

"I've been aware of the bomb's signal almost since she left here. But she isn't. She seems to have some kind of natural immunity."

"Like yours when you were an iceman?"

"No, not that. That was like immunity to toothache because I'd no teeth. Dawn . . . the signal seems to go through her without touching anything. I'm less worried about her now. I don't think she's in any real danger, not while she has that natural immunity."

"And have you any idea where the bomb—"

"Be patient, inspector. And don't talk any more."

There was a long silence. The strain was still on Andrew's face. Twenty miles away, the girl he loved was picking her way through a marsh of insanity. Despite her apparent safety, at any moment she might trip and fall in the bog, to disappear forever in an instant.

"I don't get it," said Andrew at last. "They're touring the city. Yet the strength of the madness signal hardly varies at all. It's the same everywhere."

"Why does that surprise you?"

"If it's underground, the strength should vary considerably. Look at it this way. Suppose it's a hundred feet down. Directly above it, the signal has to penetrate just a hundred feet of soil, which it's well able to do. But a mile away the signal has to penetrate more than a mile of solid ground, which should leave it pretty weak."

"The transmission is directional, then?"

"I guess so. But maybe I'm wrong."

Another long silence.

Then suddenly Andrew was on his feet, talking excitedly. But not to Morris. He was talking to Dawn, twenty miles away.

"That's O.K. darling. I've got what I need now. For the love of Mike, come back here before anything happens. Come back here, Dawn. *Come back!*"

Then he sat down, suddenly looking exhausted.

"You've got what you need?" asked Morris sharply.

"The bomb's above ground."

"*Above* ground?"

Andrew nodded. "I got a blast there that rocked me back on my heels. It shook Dawn, too. I guess she'll be quite glad to be on her way out of Garthmoor."

"Did she understand you just now?"

"No, I don't think so. But she got the general idea. The car's on its way back, and she's still O.K."

"And the bomb?"

"In the government buildings."

"Huh? What's it doing there?"

"My guess," said Andrew, beginning to laugh softly, "is that it's an unidentified object in the war museum."

The dementia bomb was duly discovered, as Andrew had sensed from twenty miles away through Dawn's baby clairvoyant talent, among the relics in the old War Department, labeled *PART OF SEBENESE SHIP, 2223-2230 WAR, HARMLESS—CHECKED FOR EXPLOSIVES. FRAGMENT OF ASTROGATION COMPUTER.* It was promptly dissolved in a bath of acid.

There was no public recognition of Andrew's services. Indeed, the whole episode remained secret. As Morris said gruffly, Andrew's pardon and his restored psionic talents were all he could expect and certainly all he'd ever need. There would be no more radiopsychosomatic cases, and Dr. Gillan of the Garthmoor City Asylum could go back to trying to cure his patients instead of making it easy for them to commit suicide. Inspector Borgman would have to detect killers again instead of simply picking up the nearest bystander who was foaming at the mouth.

Andrew and Dawn did not go back to being night-club entertainers. The possibilities before them were so immense that they decided to take a couple of months to think about them, in the dull intervals of an extended honeymoon. It was unlikely they would remain in Garthmoor, where Andrew had been an iceman.

The real story of the Coes was only beginning. But the story of the dementia bomb ended, naturally, in Axtel's War Department.

Forgotten again, Horace Phelps wrestled with a report and his conscience.

A man called Morris had given him a bad half-hour, one of the worst half-hours of Phelps' sheltered life. Phelps, who had had little or no contact with the world outside the musty War Department for a very long time, wanted no more during the rest of his life. Particularly he didn't want ever again to encounter Police Chief Morris, who had been quite rude.

Horace Phelps cordially wished he had never found that report about the Sebenese bomb.

And if it had only been somewhere else . . . if they had found it anywhere but in the War Department, with that unfortunate note on it, *PART OF SEBENESE SHIP, 2223-2230 WAR. HARMLESS—CHECKED FOR EXPLOSIVES. FRAGMENT OF ASTROGATION COMPUTER.*

If only they hadn't found it in the War Department itself, everything would have been all right. Morris might even have thanked him for the warning instead of calling him all those unpleasant names.

Phelps had every intention of forgetting the whole episode as soon as possible.

Meantime, there remained the question of the report. Something had to go on file.

He stared at the original order which had started it all, the order for the location and immunization of a bomb believed dropped in the Garthmoor area on the night of October 17, 2229.

Sighing, he added in spidery handwriting:

Located and destroyed April 34, 2278. ■

in time to come

The major news about next month this time is, of course, that on The Editor's Page. Next month's issue will be in the digest size again; if you haven't read The Editor's Page, it is suggested you do so.

The new small size will start off with a Jack Schoenherr cover for the James Schmitz novelette, "Goblin Night." Telzey Amberdon is back with us—and her encounter this time is not with the immensely powerful and dangerous—because they were highly intelligent—crest-cats, but with an interesting organism native to her home planet. One known, for good an sufficient reasons, as "the spook." Unlike the Earthly—or should one say unearthly?—spooks of old Terra, these spooks were very material. Also very fast, incredibly silent, and very carnivorous . . .

Also coming up next month will be an article, "The Space Technology of a Track Meet," by Robert S. Richardson, an unusually qualified examiner of the question. Richardson is, of course, well known as an astrophysicist; that he was also a championship hundred-yard runner somewhat fewer people realize. However, trying to figure out how high a high jumper could soar on the Moon at one-sixth Earth's gravity is not so simple. For clearing a six-foot bar, how much does a man lift his center of gravity—not just his feet? There is reason to suspect that a man could run faster on Jupiter than on Mars! Authors with high-jumping heroes please note.

In fact about the only track events we can really be sure of are the shot put and the javelin throw!

THE EDITOR

BALANCED ECOLOGY

It's sometimes hard to define the term "pet"—
and to decide which is whose pet.
Let's just say "symbiote" and let it go . . .

JAMES H. SCHMITZ

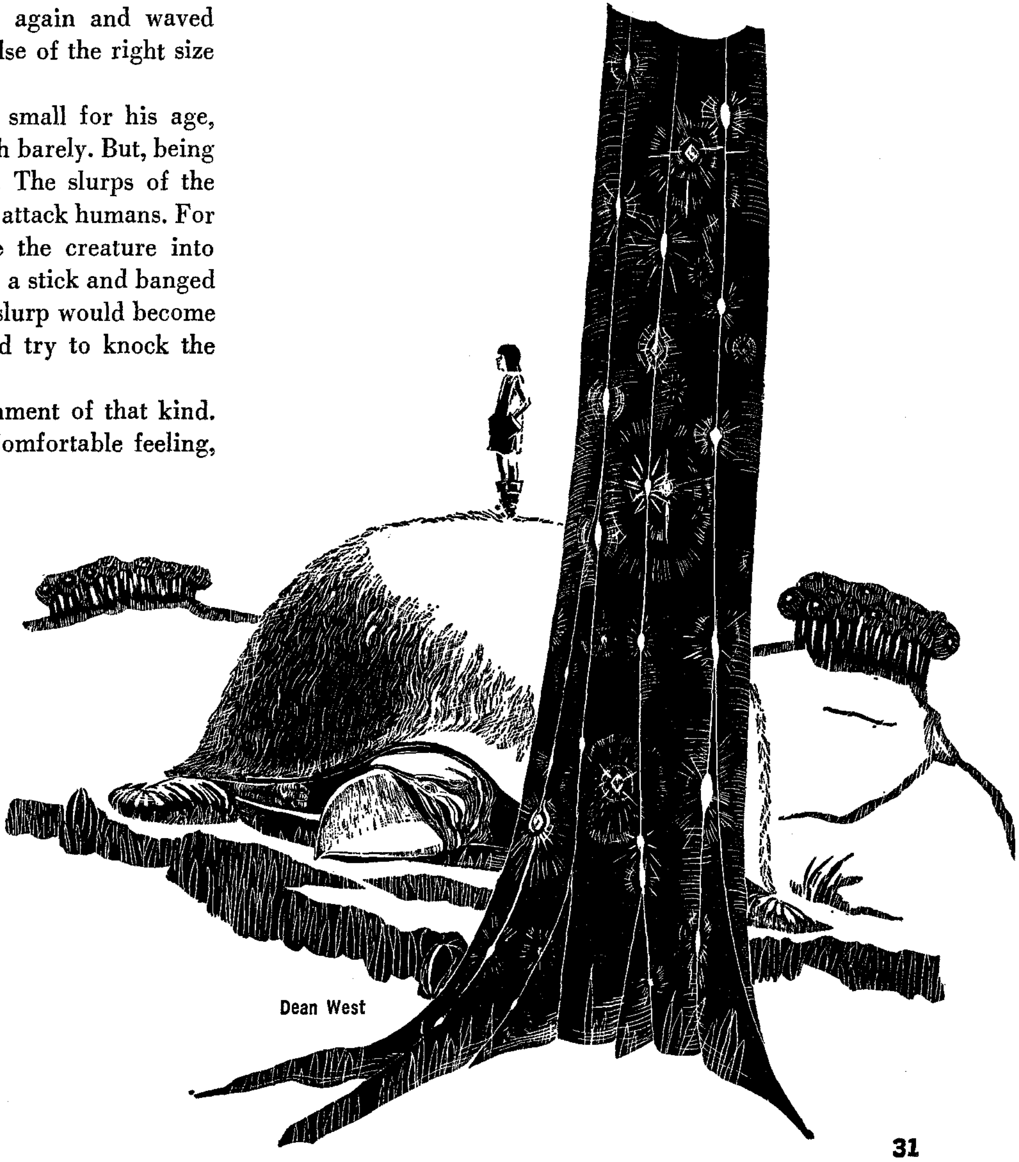
The diamondwood tree farm was restless this morning. Ilf Cholm had been aware of it for about an hour but had said nothing to Auris, thinking he might be getting a summer fever or a stomach upset and imagining things and that Auris would decide they should go back to the house so Ilf's grandmother could dose him. But the feeling continued to grow, and by now Ilf knew it was the farm.

Outwardly, everyone in the forest appeared to be going about their usual business. There had been a rainfall earlier in the day; and the tumbleweeds had uprooted themselves and were moving about in the bushes, lapping water off the leaves. Ilf had noticed a small one rolling straight towards a waiting slurp and stopped for a moment to watch the slurp catch it. The slurp was of average size, which gave it a tongue-reach of between twelve and fourteen feet, and the tumbleweed was already within range.

The tongue shot out suddenly, a thin, yellow flash. Its tip flicked twice around the tumbleweed, jerked it off the ground and back to the feed opening in the imitation tree stump within which the rest of the slurp was concealed. The tumbleweed said "Oof!" in the surprised way they always did when something caught them, and went in through the opening. After a moment, the slurp's tongue tip appeared in the opening again and waved gently around, ready for somebody else of the right size to come within reach.

Ilf, just turned eleven and rather small for his age, was the right size for this slurp, though barely. But, being a human boy, he was in no danger. The slurps of the diamondwood farms on Wrake didn't attack humans. For a moment, he was tempted to tease the creature into a brief fencing match. If he picked up a stick and banged on the stump with it a few times, the slurp would become annoyed and dart its tongue out and try to knock the stick from his hand.

But it wasn't the day for entertainment of that kind. Ilf couldn't shake off his crawly, uncomfortable feeling,



Dean West

and while he had been standing there, Auris and Sam had moved a couple of hundred feet farther uphill, in the direction of the Queen Grove, and home. He turned and sprinted after them, caught up with them as they came out into one of the stretches of grassland which lay between the individual groves of diamondwood trees.

Auris, who was two years, two months, and two days older than Ilf, stood on top of Sam's semiglobular shell, looking off to the right towards the valley where the diamondwood factory was. Most of the world of Wrake was on the hot side, either rather dry or rather steamy; but this was cool mountain country. Far to the south, below the valley and the foothills behind it, lay the continental plain, shimmering like a flat, green-brown sea. To the north and east were higher plateaus, above the level where the diamondwood liked to grow. Ilf ran past Sam's steadily moving bulk to the point where the forward rim of the shell made a flat upward curve, close enough to the ground so he could reach it.

Sam rolled a somber brown eye back for an instant as Ilf caught the shell and swung up on it, but his huge beaked head didn't turn. He was a mossback, Wrake's version of the turtle pattern, and, except for the full-grown trees and perhaps some members of the clean-up squad, the biggest thing on the farm. His corrugated shell was overgrown with a plant which had the appearance of long green fur; and occasionally when Sam fed, he would extend and use a pair of heavy arms with three-fingered hands, normally held folded up against the lower rim of the shell.

Auris had paid no attention to Ilf's arrival. She still seemed to be watching the factory in the valley. She and Ilf were cousins but didn't resemble each other. Ilf was small and wiry, with tight-curled red hair. Auris was slim and blond, and stood a good head taller than he did. He thought she looked as if she owned everything she could see from the top of Sam's shell; and she did, as a matter of fact, own a good deal of it—nine tenths of the diamondwood farm and nine tenths of the factory. Ilf owned the remaining tenth of both.

He scrambled up the shell, grabbing the moss-fur to haul himself along, until he stood beside her. Sam, awkward as he looked when walking, was moving at a good ten miles an hour, clearly headed for the Queen Grove. Ilf didn't know whether it was Sam or Auris who had decided to go back to the house. Whichever it had been, he could feel the purpose of going there.

"They're nervous about something," he told Auris, meaning the whole farm. "Think there's a big storm coming?"

"Doesn't look like a storm," Auris said.

Ilf glanced about the sky, agreed silently. "Earthquake, maybe?"

Auris shook her head. "It doesn't feel like earthquake."

She hadn't turned her gaze from the factory. Ilf asked, "Something going on down there?"

Auris shrugged. "They're cutting a lot today," she said. "They got in a limit order."

Sam swayed on into the next grove while Ilf considered the information. Limit orders were fairly unusual; but it hardly explained the general uneasiness. He sighed, sat down, crossed his legs, and looked about. This was a grove of young trees, fifteen years and less. There was plenty of open space left between them. Ahead, a huge tumbleweed was dying, making happy, chuckling sounds as it pitched its scarlet seed pellets far out from its slowly unfolding leaves. The pellets rolled hurriedly farther away from the old weed as soon as they touched the ground. In a twelve-foot circle about their parent, the earth was being disturbed, churned, shifted steadily about. The clean-up squad had arrived to dispose of the dying tumbleweed; as Ilf looked, it suddenly settled six or seven inches deeper into the softened dirt. The pellets were hurrying to get beyond the reach of the clean-up squad so they wouldn't get hauled down, too. But half-grown tumbleweeds, speckled yellow-green and ready to start their rooted period, were rolling through the grove towards the disturbed area. They would wait around the edge of the circle until the clean-up squad finished, then move in and put down their roots. The ground where the squad had worked recently was always richer than any other spot in the forest.

Ilf wondered, as he had many times before, what the clean-up squad looked like. Nobody ever caught so much as a glimpse of them. Riquol Cholm, his grandfather, had told him of attempts made by scientists to catch a member of the squad with digging machines. Even the smallest ones could dig much faster than the machines could dig after them, so the scientists always gave up finally and went away.

"Ilf, come in for lunch!" called Ilf's grandmother's voice.

Ilf filled his lungs, shouted, "Coming, grand—"

He broke off, looked up at Auris. She was smirking.

"Caught me again," Ilf admitted. "Dumb humbugs!" He yelled, "Come out, Lying Lou! I know who it was."

Meldy Cholm laughed her low, sweet laugh, a silverbell called the giant greenweb of the Queen Grove sounded its deep harp note, more or less all together. Then Lying Lou and Gabby darted into sight, leaped up on the mossback's hump. The humbugs were small, brown, bobtailed animals, built with spider leanness and very quick. They had round skulls, monkey faces, and the pointed teeth of animals who lived by catching and killing other animals. Gabby sat down beside Ilf, inflating and deflating his voice pouch, while Lou burst into a series of rattling, clicking, spitting sounds.

"They've been down at the factory?" Ilf asked.

"Yes," Auris said. "Hush now. I'm listening."

Lou was jabbering along at the rate at which the humbugs chattered among themselves, but this sounded like, and was, a recording of human voices played back at high speed. When Auris wanted to know what people somewhere were talking about, she sent the humbugs off to listen. They remembered everything they heard, came back and repeated it to her at their own speed, which saved time. Ilf, if he tried hard, could understand scraps of it. Auris understood it all. She was hearing now what the people at the factory had been saying during the morning.

Gabby inflated his voice pouch part way, remarked in Grandfather Riquol's strong, rich voice, "My, my! We're not being quite on our best behavior today, are we, Ilf?"

"Shut up," said Ilf.

"Hush now," Gabby said in Auris' voice. "I'm listening." He added in Ilf's voice, sounding crestfallen, "Caught me again!" then chuckled nastily.

Ilf made a fist of his left hand and swung fast. Gabby became a momentary brown blur, and was sitting again on Ilf's other side. He looked at Ilf with round, innocent eyes, said in a solemn tone. "We must pay more attention to details, men. Mistakes can be expensive!"

He'd probably picked that up at the factory. Ilf ignored him. Trying to hit a humbug was a waste of effort. So was talking back to them. He shifted his attention to catching what Lou was saying; but Lou had finished up at that moment. She and Gabby took off instantly in a leap from Sam's back and were gone in the bushes. Ilf thought they were a little jittery and erratic in their motions today, as if they, too, were keyed up even more than usual. Auris walked down to the front lip of the shell and sat on it, dangling her legs. Ilf joined her there.

"What were they talking about at the factory?" he asked.

"They did get in a limit order yesterday," Auris said. "And another one this morning. They're not taking any more orders until they've filled those two."

"That's good, isn't it?" Ilf asked.

"I guess so."

After a moment, Ilf asked, "Is that what *they're* worrying about?"

"I don't know," Auris said. But she frowned.

Sam came lumbering up to another stretch of open ground, stopped while he was still well back among the trees. Auris slipped down from the shell, said, "Come on but don't let them see you," and moved ahead through the trees until she could look into the open. Ilf followed her as quietly as he could.

"What's the matter?" he inquired. A hundred and fifty yards away, on the other side of the open area, towered the Queen Grove, its tops dancing gently like armies of slender green spears against the blue sky. The house wasn't visible from here; it was a big one-story bungalow built around the trunks of a number of trees deep within the grove. Ahead of them lay the road which came up from the valley and wound on through the mountains to the west.

Auris said, "An aircar came down here a while ago . . . There it is!"

They looked at the aircar parked at the side of the road on their left, a little distance away. Opposite the car was an opening in the Queen Grove where a path led to the house. Ilf couldn't see anything very interesting about the car. It was neither new nor old, looked like any ordinary aircar. The man sitting inside it was nobody they knew.

"Somebody's here on a visit," Ilf said.

"Yes," Auris said. "Uncle Kugus has come back."

Ilf had to reflect an instant to remember who Uncle Kugus was. Then it came to his mind in a flash. It had been some while ago, a year or so. Uncle Kugus was a big, handsome man with thick, black eyebrows, who always smiled. He wasn't Ilf's uncle but Auris'; but he'd had presents for both of them when he arrived. He had told Ilf a great many jokes. He and Grandfather Riquol had argued on one occasion for almost two hours about something or other; Ilf couldn't remember now what it had been. Uncle Kugus had come and gone in a tiny, beautiful, bright yellow aircar, had taken Ilf for a couple of rides in it, and told him about winning races with it. Ilf hadn't had too bad an impression of him.

"That isn't him," he said, "and that isn't his car."

"I know. He's in the house," Auris said. "He's got a couple of people with him. They're talking with Riquol and Meldy."

A sound rose slowly from the Queen Grove as she spoke, deep and resonant, like the stroke of a big, old clock or the hum of a harp. The man in the aircar turned his head towards the grove to listen. The sound was repeated twice. It came from the giant greenweb at the far end of the grove and could be heard all over the farm, even, faintly, down in the valley when the wind was favorable. Ilf said, "Lying Lou and Gabby were up here?"

"Yes. They went down to the factory first, then up to the house."

"What are they talking about in the house?" Ilf inquired.

"Oh, a lot of things." Auris frowned again. "We'll go and find out, but we won't let them see us right away."

Something stirred beside Ilf. He looked down and saw Lying Lou and Gabby had joined them again. The humbugs peered for a moment at the man in the aircar, then flicked out into the open, on across the road, and into the Queen Grove, like small, flying shadows, almost impossible to keep in sight. The man in the aircar looked about in a puzzled way, apparently uncertain whether he'd seen something move or not.

"Come on," Auris said.

Ilf followed her back to Sam. Sam lifted his head and extended his neck. Auris swung herself upon the edge of the undershell beside the neck, crept on hands and knees into the hollow between the upper and lower shells. Ilf climbed in after her. The shell-cave was a familiar place. He'd scuttled in there many times when they'd been caught outdoors in one of the violent electric storms which came down through the mountains from the north or when the ground began to shudder in an earthquake's first rumbling. With the massive curved shell above him and the equally massive flat shell below, the angle formed by the cool, leathery wall which was the side of Sam's neck and the front of his shoulder seemed like the safest place in the world to be on such occasions.

The undershell tilted and swayed beneath Ilf now as the mossback started forward. He squirmed around and looked out through the opening between the shells. They moved out of the grove, headed towards the road at Sam's steady walking pace. Ilf couldn't see the aircar and wondered why Auris didn't want the man in the car to see them. He wriggled uncomfortably. It was a strange, uneasy-making morning in every way.

They crossed the road, went swishing through high grass with Sam's ponderous side-to-side sway like a big ship sailing over dry land, and came to the Queen Grove. Sam moved on into the green-tinted shade under the Queen Trees. The air grew cooler. Presently he turned to the right, and Ilf saw a flash of blue ahead. That was the great thicket of flower bushes, in the center of which was Sam's sleeping pit.

Sam pushed through the thicket, stopped when he reached the open space in the center to let Ilf and Auris climb out of the shell-cave. Sam then lowered his forelegs, one after the other, into the pit, which was lined so solidly with tree roots that almost no earth showed between them, shaped like a mold to fit the lower half of his body, tilted forward, drawing neck and head back under his shell, slid slowly into the pit, straightened out and settled down. The edge of his upper shell was now level with the edge of the pit, and what still could be seen of him looked simply like a big, moss-grown boulder. If nobody came to disturb him, he might stay there unmoving the rest of the year. There were mossbacks in other groves of the farm which had never come out of their sleeping pits or given any indication of being awake since Ilf could remember. They lived an enormous length of time and a nap of half a dozen years apparently meant nothing to them.

Ilf looked questioningly at Auris. She said, "We'll go up to the house and listen to what Uncle Kugus is talking about."

They turned into a path which led from Sam's place to the house. It had been made by six generations of human children, all of whom had used Sam for transportation about the diamondwood farm. He was half again as big as any other mossback around and the only one whose sleeping pit was in the Queen Grove. Everything about the Queen Grove was special, from the trees themselves, which were never cut and twice as thick and almost twice as tall as the trees of other groves, to Sam and his blue flower thicket, the huge stump of the Grandfather Slurp not far away, and the giant greenweb at the other end of the grove. It was quieter here; there were fewer of the other animals. The Queen Grove, from what Riquol Cholm had told Ilf, was the point from which the whole diamondwood forest had started a long time ago.

Auris said, "We'll go around and come in from the back. They don't have to know right away that we're here . . ."

"Mr. Terokaw," said Riquol Cholm, "I'm sorry Kugus Ovin persuaded you and Mr. Bliman to accompany him to Wrake on this business. You've simply wasted your time. Kugus should have known better. I've discussed the situation quite thoroughly with him on other occasions."

"I'm afraid I don't follow you, Mr. Cholm," Mr. Terokaw said stiffly. "I'm making you a businesslike proposition in regard to this farm of diamondwood trees—a proposition which will be very much to your advantage as well as to that of the children whose property the Diamondwood is. Certainly you should at least be willing to listen to my terms!"

Riquol shook his head. It was clear that he was angry with Kugus but attempting to control his anger.

"Your terms, whatever they may be, are not a factor in this," he said. "The maintenance of a diamondwood forest is not entirely a business proposition. Let me explain that to you—as Kugus should have done.

"No doubt you're aware that there are less than forty such forests on the world of Wrake and that attempts to grow the trees elsewhere have been uniformly unsuccessful. That and the unique beauty of diamondwood products, which has never been duplicated by artificial means, is, of course, the reason that such products command a price which compares with that of precious stones and similar items."

Mr. Terokaw regarded Riquol with a bleak blue eye, nodded briefly. "Please continue, Mr. Cholm."

"A diamondwood forest," said Riquol, "is a great deal more than an assemblage of trees. The trees are a basic factor, but still only a factor, of a closely integrated, balanced natural ecology. The manner of independence of the plants and animals that make up a diamondwood forest is not clear in all details, but the interdependence is a very pronounced one. None of the involved species seem able to survive in any other environment. On the other hand, plants and animals not naturally a part of this ecology will not thrive if brought into it. They move out or vanish quickly. Human beings appear to be the only exception to that rule."

"Very interesting," Mr. Terokaw said dryly.

"It is," said Riquol. "It is a very interesting natural situation and many people, including Mrs. Cholm and myself, feel it should be preserved. The studied, limited cutting practiced on the diamondwood farms at present acts towards its preservation. That degree of harvesting actually is beneficial to the forests, keeps them moving through an optimum cycle of growth and maturity. They are flourishing under the hand of man to an extent which was not usually attained in their natural, untouched state. The people who are at present responsible for them—the farm owners and their associates—have been working for some time to have all diamondwood forests turned into Federation preserves, with the right to harvest them retained by the present owners and their heirs under the same carefully supervised conditions. When Auris and Ilf come of age and can sign an agreement to that effect, the farms will in fact become Federation preserves. All other steps to that end have been taken by now.

"That, Mr. Terokaw, is why we're not interested in your business proposition. You'll discover, if you wish to sound them out on it, that the other diamondwood farmers are not interested in it either. We are all of one mind in that matter. If we weren't, we would long since have accepted propositions essentially similar to yours."

There was silence for a moment. Then Kugus Ovin said pleasantly, "I know you're annoyed with me, Riquol, but I'm thinking of Auris and Ilf in this. Perhaps in your concern for the preservation of a natural phenomenon, you aren't sufficiently considering their interests."

Riquol looked at him, said, "When Auris reaches maturity, she'll be an extremely wealthy young woman, even if this farm never sells another cubic foot of diamondwood from this day on. Ilf would be sufficiently well-to-do to make it unnecessary for him ever to work a stroke in his life—though I doubt very much he would make such a choice."

Kugus smiled. "There are degrees even to the state of being extremely wealthy," he remarked. "What my niece can expect to gain in her lifetime from this careful harvesting you talk about can't begin to compare with what she would get at one stroke through Mr. Terokaw's offer. The same, of course, holds true of Ilf."

"Quite right," Mr. Terokaw said heavily. "I'm generous in my business dealings, Mr. Cholm. I have a reputation for it. And I can afford to be generous because I profit well from my investments. Let me bring another point to your attention. Interest in diamondwood products throughout the Federation waxes and wanes, as you must be aware. It rises and falls. There are fashions and fads. At present, we are approaching the crest of a new wave of interest in these products. This interest can be properly stimulated and exploited, but in any event we must expect it will have passed its peak in another few months. The next interest peak might develop six years from now, or twelve years from now. Or it might never develop since there are very few natural products which cannot eventually be duplicated and usually surpassed by artificial methods, and there is no good reason to assume that diamondwood will remain an exception indefinitely.

"We should be prepared, therefore, to make the fullest use of this bonanza while it lasts. I am prepared to do just that, Mr. Cholm. A cargo ship full of cutting equipment is at present stationed a few hours' flight from Wrake. This machinery can be landed and in operation here within a day after the contract I am offering you is signed. Within a week, the forest can be leveled. We shall make no use of your factory here, which would be entirely inadequate for my purpose. The diamondwood will be shipped at express speeds to another world where I have adequate processing facilities set up. And we can hit the Federation's main markets with the finished products the following month."

Riquol Cholm said, icily polite now, "And what would be the reason for all that haste, Mr. Terokaw?"

Mr. Terokaw looked surprised. "To insure that we have no competition, Mr. Cholm. What else? When the other diamondwood farmers here discover what has happened, they may be tempted to follow our example. But we'll be so far ahead of them that the diamondwood boom will be almost entirely to our exclusive advantage. We have taken every precaution to see that. Mr. Bliman, Mr. Ovin and I arrived here in the utmost secrecy today. No one so much as suspects that we are on Wrake, much less what our purpose is. I make no mistakes in such matters, Mr. Cholm!"

He broke off and looked around as Meldy Cholm said in a troubled voice, "Come in, children. Sit down over there. We're discussing a matter which concerns you."

"Hello, Auris!" Kugus said heartily. "Hello, Ilf! Remember old Uncle Kugus?"

"Yes," Ilf said. He sat down on the bench by the wall beside Auris, feeling scared.

"Auris," Riquol Cholm said, "did you happen to overhear anything of what was being said before you came into the room?"

Auris nodded. "Yes." She glanced at Mr. Terokaw, looked at Riquol again. "He wants to cut down the forest."

"It's your forest and Ilf's, you know. Do you want him to do it?"

"Mr. Cholm, please!" Mr. Terokaw protested. "We must approach this properly. Kugus, show Mr. Cholm what I'm offering."

Riquol took the document Kugus held out to him, looked over it. After a moment, he gave it back to Kugus. "Auris," he said, "Mr. Terokaw, as he's indicated, is offering you more money than you would ever be able to spend in your life for the right to cut down your share of the forest. Now . . . do you want him to do it?"

"No." Auris said.

Riquol glanced at Ilf, who shook his head. Riquol turned back to Mr. Terokaw.

"Well, Mr. Terokaw," he said, "there's your answer. My wife and I don't want you to do it, and Auris and Ilf don't want you to do it. Now . . ."

"Oh, come now, Riquol!" Kugus said, smiling. "No one can expect either Auris or Ilf to really understand what's involved here. When they come of age—"

"When they come of age," Riquol said, "they'll again have the opportunity to decide what they wish to do." He made a gesture of distaste. "Gentlemen, let's conclude this discussion. Mr. Terokaw, we thank you for your offer, but it's been rejected."

Mr. Terokaw frowned, pursed his lips.

"Well, not so fast, Mr. Cholm," he said. "As I told you, I make no mistakes in business matters. You suggested a few minutes ago that I might contact the other diamondwood farmers on the planet on the subject but predicted that I would have no better luck with them."

"So I did," Riquol agreed. He looked puzzled.

"As a matter of fact," Mr. Terokaw went on, "I already have contacted a number of these people. Not in person, you understand, since I did not want to tip off certain possible competitors that I was interested in diamondwood at present. The offer was rejected, as you indicated it would be. In fact, I learned that the owners of the Wrake diamondwood farms are so involved in legally binding agreements with one another that it would be very difficult for them to accept such an offer even if they wished to do it."

Riquol nodded, smiled briefly. "We realized that the temptation to sell out to commercial interests who would not be willing to act in accordance with our accepted policies could be made very strong," he said. "So we've made it as nearly impossible as we could for any of us to yield to temptation."

"Well," Mr. Terokaw continued, "I am not a man who is easily put off. I ascertained that you and Mrs. Cholm are also bound by such an agreement to the other diamondwood owners of Wrake not to be the first to sell either the farm or its cutting rights to outside interests, or to exceed the established limits of cutting. But you are not the owners of this farm. These two children own it between them."

Riquol frowned. "What difference does that make?" he demanded. "Ilf is our grandson. Auris is related to us and our adopted daughter."

Mr. Terokaw rubbed his chin.

"Mr. Bliman," he said, "please explain to these people what the legal situation is."

Mr. Bliman cleared his throat. He was a tall, thin man with fierce dark eyes, like a bird of prey. "Mr. and Mrs. Cholm," he began, "I work for the Federation Government and am a specialist in adoptive procedures. I will make this short. Some months ago, Mr. Kugus Ovin filed the necessary papers to adopt his niece, Auris Luteel, citizen of Wrake. I conducted the investigation which is standard in such cases and can assure you that no official record exists that you have at any time gone through the steps of adopting Auris."

"*What?*" Riquol came half to his feet. Then he froze in position for a moment, settled slowly back in his chair. "What is this? Just what kind of trick are you trying to play?" he said. His face had gone white.

Ilf had lost sight of Mr. Terokaw for a few seconds, because Uncle Kugus had suddenly moved over in front of the bench on which he and Auris were sitting. But now he saw him again and he had a jolt of fright. There was a large blue and silver gun in Mr. Terokaw's hand, and the muzzle of it was pointed very steadily at Riquol Cholm.

"Mr. Cholm," Mr. Terokaw said, "before Mr. Bliman concludes his explanation, allow me to caution you! I do not wish to kill you. This gun, in fact, is not designed to kill. But if I pull the trigger, you will be in excruciating pain for some minutes. You are an elderly man and it is possible that you would not survive the experience. This would not inconvenience us very seriously. Therefore, stay seated and give up any thoughts of summoning help . . . Kugus, watch the children. Mr. Bliman, let me speak to Mr. Het before you resume."

He put his left hand up to his face, and Ilf saw he was wearing a wrist-talker. "Het," Mr. Terokaw said to the talker without taking his eyes off Riquol Cholm, "you are aware, I believe, that the children are with us in the house?"

The wrist-talker made murmuring sounds for a few seconds, then stopped.

"Yes," Mr. Terokaw said. "There should be no problem about it. But let me know if you see somebody approaching the area . . ." He put his hand back down on the table. "Mr. Bliman, please continue."

Mr. Bliman cleared his throat again.

"Mr. Kugus Ovin," he said, "is now officially recorded as the parent by adoption of his niece, Auris Luteel. Since Auris has not yet reached the age where her formal consent to this action would be required, the matter is settled."

"Meaning," Mr. Terokaw added, "that Kugus can act for Auris in such affairs as selling the cutting rights on this tree farm. Mr. Cholm, if you are thinking of taking legal action against us, forget it. You may have had certain papers purporting to show that the girl was your adopted child filed away in the deposit vault of a bank. If so, those papers have been destroyed. With enough money, many things become possible. Neither you nor Mrs. Cholm nor the two children will do or say anything that might cause trouble to me. Since you have made no rash moves, Mr. Bliman will now use an instrument to put you and Mrs. Cholm painlessly to sleep for the few hours required to get you off this planet. Later, if you should be questioned in connection with this situation, you will say about it only what certain psychological experts will have impressed on you to say, and within a few months, nobody will be taking any further interest whatever in what is happening here today.

"Please do not think that I am a cruel man. I am not. I merely take what steps are required to carry out my purpose. Mr. Bliman, please proceed!"

Ilf felt a quiver of terror. Uncle Kugus was holding his wrist with one hand and Auris' wrist with the other, smiling reassuringly down at them. Ilf darted a glance over to Auris' face. She looked as white as his grandparents but she was making no attempt to squirm away from Kugus, so Ilf stayed quiet, too. Mr. Bliman stood up, looking more like a fierce bird of prey than ever, and stalked over to Riquol Cholm, holding something in his hand that looked unpleasantly like another gun. Ilf shut his eyes. There was a moment of silence, then Mr. Terokaw said, "Catch him before he falls out of the chair. Mrs. Cholm, if you will just settle back comfortably . . ."

There was another moment of silence. Then, from beside him, Ilf heard Auris speak.

It wasn't regular speech but a quick burst of thin, rattling gabble, like human speech speeded up twenty times or so. It ended almost immediately.

"What's that? What's that?" Mr. Terokaw said, surprised.

Ilf's eyes flew open as something came in through the window with a whistling shriek. The two humbugs were in the room, brown blurs flicking here and there, screeching like demons. Mr. Terokaw exclaimed something in a loud voice and jumped up from the chair, his gun swinging this way and that. Something scuttled up Mr. Bliman's back like a big spider, and he yelled and spun away from Meldy Cholm lying slumped back in her chair. Something ran up Uncle Kugus' back. He yelled, letting go of Ilf and Auris, and pulled out a gun of his own. "Wide aperture!" roared Mr. Terokaw, whose gun was making loud, thumping noises. A brown shadow swirled suddenly about his knees. Uncle Kugus cursed, took aim at the shadow and fired.

"Stop that, you fool!" Mr. Terokaw shouted. "You nearly hit me."

"Come," whispered Auris, grabbing Ilf's arm. They sprang up from the bench and darted out the door behind Uncle Kugus' broad back.

"Het!" Mr. Terokaw's voice came bellowing down the hall behind them. "Up in the air and look out for those children! They're trying to get away. If you see them start to cross the road, knock 'em out. Kugus—after them! They may try to hide in the house."

Then he yowled angrily, and his gun began making the thumping noises again. The humbugs were too small to harm people, but their sharp little teeth could hurt and they seemed to be using them now.

"In here," Auris whispered, opening a door. Ilf ducked into the room with her, and she closed the door softly behind them. Ilf looked at her, his heart pounding wildly.

Auris nodded at the barred window. "Through there! Run and hide in the grove. I'll be right behind you . . ."

"Auris! Ilf!" Uncle Kugus called in the hall. "Wait—don't be afraid. Where are you?" His voice still seemed to be smiling. Ilf heard his footsteps hurrying along the hall as he squirmed quickly sideways between two of the thick wooden bars over the window, dropped to the ground. He turned, darted off towards the nearest bushes. He heard Auris gabble something to the humbugs again, high and shrill, looked back as he reached the bushes and saw her already outside, running towards the shrubbery on his right. There was a shout from the window. Uncle Kugus was peering out from behind the bars, pointing a gun at Auris. He fired. Auris swerved to the side, was gone among the shrubs. Ilf didn't think she had been.

"They're outside!" Uncle Kugus yelled. He was too big to get through the bars himself.

Mr. Terokaw and Mr. Bliman were also shouting within the house. Uncle Kugus turned around, disappeared from the window.

"Auris!" Ilf called, his voice shaking with fright.

"Run and hide, Ilf!" Auris seemed to be on the far side of the shrubbery, deeper in the Queen Grove.

Ilf hesitated, started running along the path that led to Sam's sleeping pit, glancing up at the open patches of sky among the treetops. He didn't see the aircar with the man Het in it. Het would be circling around the Queen Grove now, waiting for the other men to chase them into sight so he could knock them out with something. But they could hide inside Sam's shell and Sam would get them across the road. "Auris, where are you?" Ilf cried.

Her voice came low and clear from behind him. "Run and hide, Ilf!"

Ilf looked back. Auris wasn't there but the two humbugs were loping up the path a dozen feet away. They darted past Ilf without stopping, disappeared around the turn ahead. He could hear the three men yelling for him and Auris to come back. They were outside, looking around for them now, and they seemed to be coming closer.

Ilf ran on, reached Sam's sleeping place. Sam lay there unmoving, like a great mossy boulder filling the pit. Ilf picked up a stone and pounded on the front part of the shell.

"Wake up!" he said desperately. "Sam, wake up!"

Sam didn't stir. And the men were getting closer. Ilf looked this way and that, trying to decide what to do.

"Don't let them see you," Auris called suddenly.

"That was the girl over there," Mr. Terokaw's voice shouted. "Go after her, Bliman!"

"Auris, watch out!" Ilf screamed, terrified.

"Aha! And here's the boy, Kugus. This way! Het," Mr. Terokaw yelled triumphantly, "come down and help us catch them! We've got them spotted . . ."

Ilf dropped to hands and knees, crawled away quickly under the branches of the blue flower thicket and waited, crouched low. He heard Mr. Terokaw crashing through the bushes towards him and Mr. Bliman braying, "Hurry up, Het! Hurry up!" Then he heard something else. It was the sound the giant greenweb sometimes made to trick a flock of silverbells into fluttering straight towards it, a deep drone which suddenly seemed to be pouring down from the trees and rising up from the ground.

Ilf shook his head dizzily. The drone faded, grew up again. For a moment, he thought he heard his own voice call "Auris, where are you?" from the other side of the blue flower thicket. Mr. Terokaw veered off in that direction, yelling something to Mr. Bliman and Kugus. Ilf backed farther away through the thicket, came out on the other side, climbed to his feet and turned.

He stopped. For a stretch of twenty feet ahead of him, the forest floor was moving, shifting and churning with a slow, circular motion, turning lumps of deep brown mold over and over.

Mr. Terokaw came panting into Sam's sleeping place, red-faced, glaring about, the blue and silver gun in his hand. He shook his head to clear the resonance of the humming air from his brain. He saw a huge, moss-covered boulder tilted at a slant away from him but no sign of Ilf.

Then something shook the branches of the thicket behind the boulder. "Auris!" Ilf's frightened voice called.

Mr. Terokaw ran around the boulder, leveling the gun. The droning in the air suddenly swelled to a roar. Two big gray, three-fingered hands came out from the boulder on either side of Mr. Terokaw and picked him up.

"Awk!" he gasped, then dropped the gun as the hands folded him, once, twice, and lifted him towards Sam's descending head. Sam opened his large mouth, closed it, swallowed. His neck and head drew back under his shell and he settled slowly into the sleeping pit again.

The greenweb's roar ebbed and rose continuously now, like a thousand harps being struck together in a bewildering, quickening beat. Human voices danced and swirled through the din, crying, wailing, screeching. Ilf stood at the edge of the twenty-foot circle of churning earth outside the blue flower thicket, half stunned by it all. He heard Mr. Terokaw bellow to Mr. Bliman to go after Auris, and Mr. Bliman squalling to Het to hurry. He heard his own voice nearby call Auris frantically and then Mr. Terokaw's triumphant yell: "This way! Here's the boy, Kugus!"

Uncle Kugus bounded out of some bushes thirty feet away, eyes staring, mouth stretched in a wide grin. He saw Ilf, shouted excitedly and ran towards him. Ilf watched, suddenly unable to move. Uncle Kugus took four long steps out over the shifting loam between them, sank ankle-deep, knee-deep. Then the brown earth leaped in cascades about him, and he went sliding straight down into it as if it were water, still grinning, and disappeared. In the distance, Mr. Terokaw roared, "This way!" and Mr. Bliman yelled to Het to hurry up. A loud, slapping sound came from the direction of the stump of the Grandfather Slurp. It was followed by a great commotion in the bushes around there; but that only lasted a moment. Then, a few seconds later, the greenweb's drone rose and thinned to the wild shriek it made when it had caught something big and faded slowly away . . .

Ilf came walking shakily through the opening in the thickets to Sam's sleeping place. His head still seemed to hum inside with the greenweb's drone but the Queen Grove was quiet again; no voices called anywhere. Sam was settled into his pit. Ilf saw something gleam on the ground near the front end of the pit. He went over and looked at it, then at the big, moss-grown dome of Sam's shell.

"Oh, Sam," he whispered, "I'm not sure we should have done it . . ."

Sam didn't stir. Ilf picked up Mr. Terokaw's blue and silver gun gingerly by the barrel and went off with it to look for Auris. He found her at the edge of the grove, watching Het's aircar on the other side of the road. The aircar was turned on its side and about a third of it was sunk in the ground. At work around and below it was the biggest member of the clean-up squad Ilf had ever seen in action.

They went up to the side of the road together and looked on while the aircar continued to shudder and turn and sink deeper into the earth. Ilf suddenly remembered the gun he was holding and threw it over on the ground next to the aircar. It was swallowed up instantly there. Tumbleweeds came rolling up to join them and clustered around the edge of the circle, waiting. With a final jerk, the aircar disappeared. The disturbed section of earth began to smooth over. The tumbleweeds moved out into it.

There was a soft whistling in the air, and from a Queen Tree at the edge of the grove a hundred and fifty feet away, a diamondwood seedling came lancing down, struck at a slant into the center of the circle where the aircar had vanished, stood trembling a moment, then straightened up. The tumbleweeds nearest it moved respectfully aside to give it room. The seedling shuddered and unfolded its first five-fingered cluster of silver-green leaves. Then it stood still.

Ilf looked over at Auris. "Auris," he said, "should we have done it?"

Auris was silent a moment.

"Nobody did anything," she said then. "They've just gone away again." She took Ilf's hand. "Let's go back to the house and wait for Riquol and Meldy to wake up."

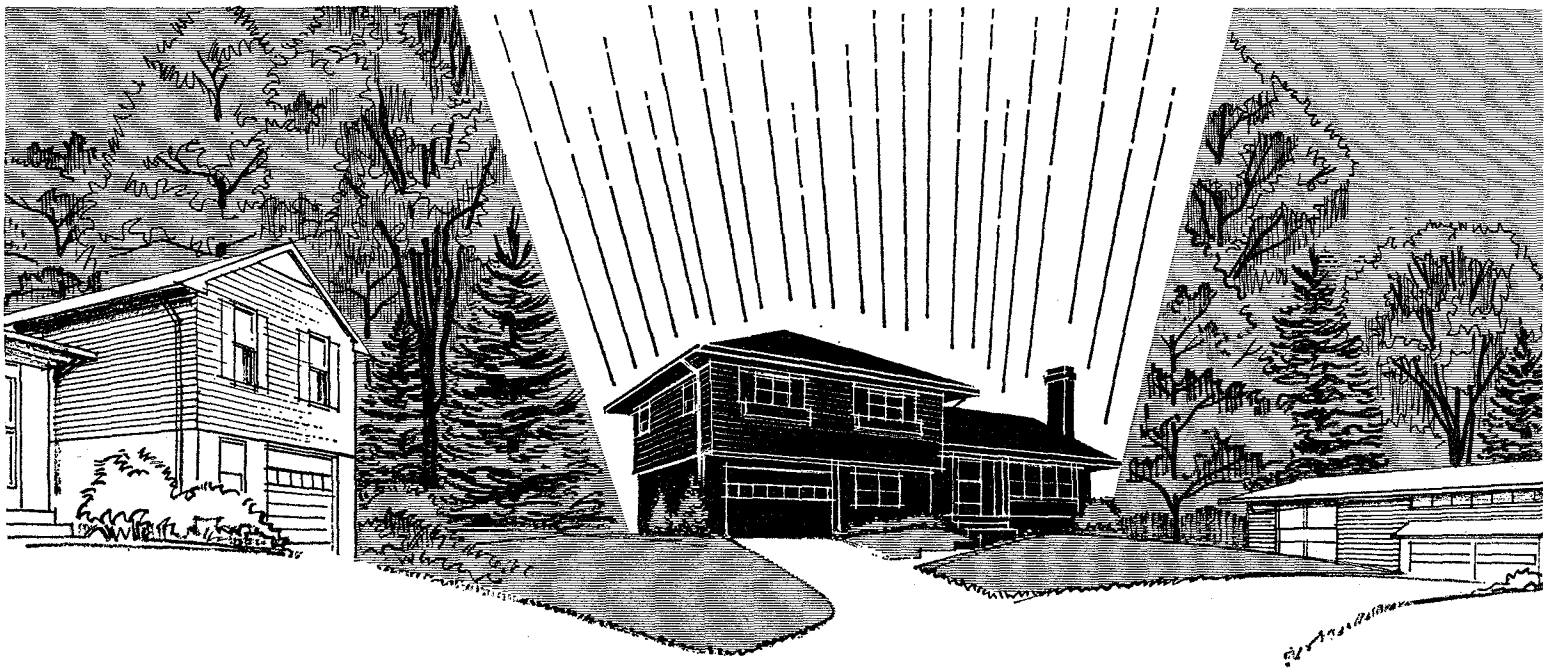
The organism that was the diamondwood forest grew quiet again. The quiet spread back to its central mind unit in the Queen Grove, and the unit began to relax towards somnolence. A crisis had been passed—perhaps the last of the many it had foreseen when human beings first arrived on the world of Wrake.

The only defense against Man was Man. Understanding that, it had laid its plans. On a world now owned by Man, it adopted Man, brought him into its ecology, and its ecology into a new and again successful balance.

This had been a final flurry. A dangerous attack by dangerous humans. But the period of danger was nearly over, would soon be for good a thing of the past.

It had planned well, the central mind unit told itself drowsily. But now, since there was no further need to think today, it would stop thinking . . ."

Sam the mossback fell gratefully asleep. ■



The Wrong House

Sometimes in a suburban development,
a house needs a beacon so you can identify it.
This one didn't need one.

MAX GUNTHER

Illustrated by Adolph Brotman

There had been a time, only a few weeks back, when Arch Clement had enjoyed this evening walk home from the bus stop. True, the neighborhood wasn't attractive yet. New housing developments seldom were—too raw, too harsh. But already, lawns were covering the bulldozed earth; young shrubs and trees were growing; the houses were taking on individuality. In a few years, what was now just a collection of almost identical houses would become a community.

Arch had enjoyed watching the early signs of this transformation as he walked home each evening. But now, somehow, all the pleasure was gone. It was frustrating because there was no logical reason for it: Nancy simply didn't like the house any more.

As he turned off the sidewalk and onto his driveway, Arch remembered gloomily how Nancy and he had sweated and saved and waited to buy this house. All through the war, when he was a bomber navigator in the Pacific. For years afterward, as he struggled to get his master's degree. And years after that, working for Harburgh Electronics, transferring back and forth across the country like a covey of tennis balls, never in one place long enough to do anything but rent. And then, finally, a job in which there was assurance of a five-year stay.

They hadn't had to house-hunt very long. Even before the real-estate agent had taken them inside the house, they'd been in love with it. The development was intelligently laid out, not in barracks-like rows but in short curves, with a great circular park in the middle. And the price—it was almost a pleasure to sign the mortgage papers. A well-built house, congenial neighbors, a neighborhood slowly working its way to attractiveness: what more could a family want?

"Arch?" Nancy called as he entered the front door.

"It's me," Arch called back.

Little Archie, four years and forty pounds of dynamite exploded from the playroom. "Hi, Daddy; Hi, Daddy!"

Arch scooped him into the air. "How's it going, pal?"

"I built a house and bombed it," Archie announced. "How do you bomb a house, Daddy?"

"Show you later," Arch said, putting him down. He made a mental note to stop telling stories about the war. Nancy had read in a child-guidance book that it was unwise to fill little heads with ideas about guns and bombs.

He tossed hat and paper on the hall table walked into the kitchen. Nancy always waited for him in the kitchen when she was feeling blue, which was quite often these days. The change in her worried Arch seriously, for Nancy was normally a happy girl, one who got a huge kick out of life. She had managed to brighten even the smallest and dingiest of their long succession of apartments. She was a tall girl, still trim after two kids, with dark-brown hair and dark-brown eyes.

He bent and kissed her as she leaned over the sink. She turned and threw her arms around his neck. "Arch," she said, her voice trembling, "let's get out of this house!"

Arch frowned, said nothing. She pulled away from him so that she could look up at his face. Her eyes implored him to understand. "Arch, I've always been level-headed about things, haven't I? I've never pulled woman's intuition on you. I—"

"Steady," Arch soothed. "Look—I'll make us a drink. Let's sit down and talk about it calmly."

She nodded, turned down the gas under her saucepans, walked into the living room. Arch made drinks and took them in. He lit her cigarette, then his own.

"Maybe one of our troubles," he said, "is that we've never really tried to find common ground on this thing." He sat in an armchair opposite her. "You're sure there's something wrong with the house. I'm sure there isn't. Now"—he took a sip of his drink—"I'm going to sit here and listen as hard as I can, with my mind as open as it'll go."

Nancy smiled. It was a relief to see her smile. "You won't frost me with that superior male logic? Word of honor?"

"Word of honor." Arch grinned back at her, then became serious. "Nance, I *want* to understand."

She leaned forward, toying with her glass on the coffee table. "I've been trying to pin down the difference between the way a man and a woman see a house," she said, slowly. "I guess a man sees it broken down into parts because he knows more about how it's built—you especially, as an engineer. You probably see the two-by-fours inside the walls, the water and gas lines underneath, the electrical wiring. But a woman thinks of a house as a single thing, with a sort of personality. She gets more involved in it emotionally."

Arch grimaced doubtfully. "I guess that makes sense."

She took a sip of her drink. "Well, either a woman likes a house or she doesn't. Maybe a psychiatrist could tell you the reasons, but I can't. If a house is to be a home, for a woman, it has to have something that makes her feel close to it." She looked down at her cigarette. "This house doesn't have it."

Arch shifted uncomfortably in his chair. "Maybe what you say is true, but—" He made a gesture of helplessness. "Look, why aren't the other women around here unhappy, too? These houses are identical, except for roof designs and color."

"No," said Nancy levelly. "Our house is different."

"Different?"

"I was over at the Nolans' house this morning, having coffee with Ellen. Ellen and I explored. There are little differences that only a woman would notice."

"No two houses are microscopically identical, even in a development," Arch pointed out. "The guys doing the building make mistakes. A half-inch error here can build up to half a foot over there. They cover up with extra hunks of molding, or—"

"No," said Nancy, "that's not what I mean."

"Give me an example."

"Well, you know how the bottom of our linen closet is about a foot and a half off the floor?"

Arch thought. "Yes. The cold-air return ducts from the master bedroom and bathroom are under there."

"In Ellen's house, the bottom of the closet is several inches lower. I found out when I leaned in, and the edge was against my shin instead of my knee. And you know that thick metal pipe in the cellar, the one that holds up the steel beam?"

"The lally column."

"Yes. Well, when Ellen hangs wash down there, she keeps her arms away from the column because it's cold. Ours is warm."

"Warm?"

"Not as warm as your arm, but not as cold as metal ought to be. And there's a funny little corner in our playroom that always gives me trouble when I'm waxing the floor. It isn't there in Ellen's house. Our furnace sounds different. And . . . oh, there are scores of little things."

Arch scratched the back of his neck, frowning. "Do you have some theory on why all this should be?"

"No. I only know that this house isn't friendly. I can't come to terms with it. I can't make it feel like a home should."

The tornadolike arrival of their seven-year-old daughter, Alice, put an end to the discussion. During dinner, the kids did most of the talking. Afterward, when the kids had scurried down to the playroom and Nancy was pouring coffee, she said:

"It makes noises at night, too. Not ordinary house noises. There's a high whining noise and a sort of pulsating hum."

"I've never heard them."

"They aren't loud. You have to listen hard."

Later, when the kids were in bed, Arch went down to the cellar. He felt the lally column, then the steel I-beam overhead. It was true: the column was warm by comparison. He put his ear to the column but heard nothing.

Then he walked around the furnace to his workshop. This was his private place—the place every man must have, no matter how small, where he can be alone with his thoughts. On the cinderblock wall above the bench hung a few pictures Arch had taken on the islands during the war. He kept them here partly to remind himself that there were other worlds besides Harburgh Electronics and this small suburban development. But mostly, he kept them because he had liked the people of the islands. They knew nothing of the disastrous war that raged beyond their horizons. They knew only that strangely-clothed men had suddenly appeared, bringing strange and wonderful machines, mowing down the jungle to build great roads called airstrips. They didn't realize until later that the building of airstrips automatically extended the war to their islands. They didn't grasp the full meaning of it all until the first bombs fell around them.

Below and around the pictures were Arch's carpentry tools, his electrical instruments and parts. Arch liked to tinker here in his spare time. Sometimes, on a week end, he even borrowed instruments from the Harburgh labs. The company wasn't overjoyed to lend out expensive instruments, but you could usually talk the brass into it on the grounds that maybe, just maybe, idle tinkering could turn up some profitable line of research.

Looking at his equipment, Arch thought of the lally column again. It intrigued him. Why should it be warm?

Well, what would create warmth without sound or detectable movement? One possibility came to mind immediately: electrical or electronic gadgetry. And suppose there was such gadgetry in the column. What would be a further symptom of its presence? A magnetic field.

Grinning to himself at the absurdity of the idea, Arch took a magnetized needle and tied a piece of thread around its middle. Dangling it from his fingers, he carried it to the column.

A prickle of unease ran down his back. The column was surrounded by a magnetic field.

He thought: Suppose I wanted to put something in a guy's house, and I didn't want him to find it, ever. Where would I put it? If I were in at the building of the house, I'd seal it into some key part of the underpinnings. Some part which, if removed or cut or in any way tampered with, would put the house in danger of sagging or collapse. The lally column.

He searched the column and the I-beam minutely, looking for wires or cables. There were none. The house was a split-level design, and the beam stretched from an outer wall to a point just under the split. Standing at the inner end of the beam and looking up, Arch judged that he was right under the linen closet whose dimensions had bothered Nancy. It was conceivable, he thought, that there could be some electrical connection between the beam and the closet—a cable, perhaps, hidden in the wall.

He took tools and went upstairs. Nancy was sitting in the living room, reading. She looked up as he passed.

"I'm going to have a look under the linen closet," he said.

She seemed relieved. "You took me seriously, then?"

He tried to look nonchalant, shrugged. "Just checking. That lally column down there . . . well, it got me wondering."

She followed him and stood behind him as he opened the closet. He handed out towels, sheets and boxes until the lower section was empty. The floor of the closet was a sheet of plywood. Trying to work carefully so as not to splinter the wood, he pried the sheet up.

He expected to see the galvanized sheet metal of the cold-air ducts. Instead, he found a blank sheet of dull, gray-green metal extending to all four sides of the closet. He tapped it with a screwdriver. It was thick and solid.

"What is it?" Nancy whispered.

He stood up. "I wish I knew."

Tomorrow, when the kids weren't asleep, he'd try to push an electric drill through that enigmatic metal floor. Meanwhile he could explore the rest of the house. Where to start? The cellar and attic, where the innards of a house are exposed.

He spent two hours in the cellar, thoroughly checking all the electrical equipment. He made sure that every cable and wire was accounted for, its exact purpose known, its meanderings traced inch by inch. He found nothing new.

Then he took a flashlight and climbed up to the attic. It was not a full attic, but merely a crawl-space under the ridgepole. He swept the flashlight beam over the sloping roof above him, saw nothing. He crawled until he guessed he was over the linen closet and examined the boards beneath him. Nothing there either. Then he started a closer examination of the juncture of roof and attic floor.

He would never have seen them if he hadn't been looking for them. At first he thought they were only at the lower edge of the roof, but soon he saw that they were everywhere, covering the entire underside of the roof. Tiny wire coils, so incredibly small they formed a network that covered the area like a blanket.

There was nothing in Arch's electronics experience to tell him what they were, or why. Slowly, he backed out of the attic.

The next day was Saturday. Arch was at the real-estate agent's office early in the morning, before the rush of house hunters began. The office consisted of a small, new, red brick building, one-story high and two-rooms wide, standing by itself near the shopping center. A sign above the door said: DRAKE, DRISCOLL & CO.—REAL ESTATE—INSURANCE.

Charles Drake was a friendly young man who insisted that everybody, bar none, address him as Charlie. He had curly blond hair, a genial face, and a habit of talking and moving at whirlwind speed even when there was no reason for it. He shook Arch's hand with both of his, as though welcoming home a lost brother.

"Yes, oh yes, I remember you, Mr. Clement. Have a seat. Nice morning. What's on your mind?"

Arch cleared his throat. "You remember showing me that house on Harwood Road? The Oak Acres Development?"

"Yes. Oak Acres. Of course I remember. How's your wife?"

"Fine. I . . . there's something funny about the house."

Drake's genial grin wavered momentarily, then returned. He leaned forward on his desk. "Funny?"

"Unusual, I mean. This may sound kind of crazy, but there's some kind of electronic equipment in the house that isn't in any of the other houses."

Drake's grin weakened perceptibly. "What kind of equipment?"'

"Mr. Drake, I—"

"Charlie."

"Charlie, I don't know what kind. I work with electronics, and if it was anything you normally find in a house I'd be able to figure it out."

Drake's grin slowly died. "What does it look like?"

Arch told him, briefly. By the time he had finished, Drake was staring, wide-eyed.

"You don't *look* crazy," Drake said, suddenly grinning. Then his grin disappeared. "Do you . . . have any theories about this gadgetry?"

"None. I was hoping maybe you could throw some light on it. Who built Oak Acres?"

"Old fellow called Herb Ketchum. He's been building in this country for years. He—" Drake suddenly looked startled. "I just happened to think. Soon as Oak Acres was buttoned up, he put his money in his pocket and left."

"Left?"

"Retired. Nobody knows where he went. Kind of unusual, matter of fact, because in a development like that, there are always loose ends. Somebody's paint peels off. Septic tank backs up. Builder at least leaves his phone number so you can argue with him."

"What kind of man was this Ketchum?"

Drake shrugged. "Ordinary old guy. Kind of money-mad. Was in a couple of shady land deals here, couple of years back. But he built a sound house. Always built a sound house."

Arch leaned forward in his chair. "You say he liked money. But the prices in Oak Acres were low—real bargains."

Drake nodded. "They were. Sold like hot cakes."

"Maybe," Arch suggested, "Ketchum priced them low so he could get his money in a hurry and take off." There were vague, disquieting ideas in his head now. He pulled out cigarettes, offered the pack to Drake. Drake shook his head. Lighting up, Arch asked: "Would you say Ketchum was the kind of guy who could be bribed?"

"Bribed? I don't know. Maybe. Depends on the situation."

"Well, suppose someone wanted electronic gadgets installed in one of Ketchum's houses—installed secretly. Suppose he offered Ketchum a whole lot of money, or land, or something else. Would Ketchum co-operate?"

"I get you. I'll say this: If Ketchum thought these gadgets would make the house unsafe, no, he wouldn't bite. If he figured they'd do no harm—maybe he would."

"He'd agree to get his men out of the development for a day or two, maybe, while this other guy tinkered?"

"Maybe. But I don't see—"

"Neither do I, yet," Arch said, standing up. "But after all, it's my house. My wife's going nuts. I've got to find out."

"Naturally," Drake agreed. He stood up and held out his hand. "Need help, give me a ring."

Arch spent the rest of the day prying around his house. His mind kept touching on ideas, then shrinking away from them. But every test he made brought him back to the same ideas. The magnetic field around the lally column, he discovered, had a configuration that any electrical engineer would label impossible. The metal sheet at the bottom of the linen closet was so tough that Arch's hardest drill failed to scratch it.

Late in the afternoon, he called Charlie Drake. "That park area in the middle of Oak Acres," he said, "who owns it?"

"Ketchum," said Drake over the phone.

"Isn't it a little unusual for a developer to leave that much land undeveloped?"

"Well . . . unusual, maybe, but not unheard-of. Helps sell the houses. Some developments even have swimming pools. Old Ketchum didn't take any loss on it, I'm sure."

"Thanks," said Arch, and hung up. He walked into the kitchen where Nancy was starting dinner. "Nance," he said, "I hate to admit it, but I'm coming to the conclusion you're right. There is definitely something screwy about this house."

She turned and looked up at him, scared. "How . . . screwy?"

"I don't know." He shrugged. "To the guy who built it, it isn't screwy at all. It only seems so to us because it's . . . well, maybe new."

He took Archie to the park, strolled around it for an hour and went back home for dinner. Afterwards, when the kids were in bed, he went outside for a smoke. It was a warm night, moonless and beautifully clear. Stars filled the sky like dust. Or like islands, perhaps, he thought.

On Monday, he talked to the Air Force officer who supervised Harburgh's work on missile guidance systems. Early the next morning, an Air Technical Intelligence team arrived at his house. Arch did not tell them any of his ideas; he merely showed them what he had found and added his guess that it might be up their alley. For a week, they probed the house and explored the neighborhood. They called in experts from universities and private industry. The house buzzed with activity from morning to night, and sometimes into the small, quiet hours of the morning.

Finally, one evening, Arch came home and found only one man left. The man was Major Harvey Weiss, who had flown in from Dayton to take charge of the investigation five days before. He was a square-built man who looked as though he might once have been a boxer. He had a massive, square jaw, a flattened, off-center nose and a heavy scar on his cheek. The only thing that saved him from ugliness was a wide and gentle mouth. The kids loved him—especially little Archie, for whom Major Weiss had requisitioned a helmet liner and a pair of Air Force corporal's stripes.

"Major Weiss is staying to dinner," Nancy told Arch as he came in the door. She looked like someone just recovering from an illness—worn but happy. She leaned close to Arch and whispered: "They want to buy the house from us."

It didn't surprise Arch. Of course they'd want it. Maybe they'd have to end up buying the whole development.

"Drink, major?" Arch asked as he stepped into the living room.

"Be delighted," said Weiss.

They settled in the living room: Weiss squat and solid in an armchair, Nancy and Arch opposite him on the sofa. Weiss sipped his drink and said: "We've appreciated your staying out of our way this past week, Mr. Clement. But I guess you must have some theories. I'd like to hear them."

Arch grinned. "Oh, I have theories, I've kept them to myself because I was afraid I'd end up in a padded cell."

Weiss grinned back. "Know what you mean."

"Remember in the Second World War, we barged into those islands in the Pacific and built airstrips?" Arch asked. "We set up radar equipment and all sorts of other stuff the island people had never seen before. They didn't even know there was a war on until we showed up. To them, the whole thing must have seemed fantastic."

Weiss nodded. "Good analogy."

Arch paused to light a cigarette. His fingers were shaking slightly. "Somewhere out there, maybe"—he waved up at the darkening evening sky that showed through the picture window—"there's a war going on. It's a war as unreal to us as ours was to the islanders. It's being fought in space, by races as far ahead of us technologically as we and the Axis were ahead of the island people."

"And now," said Weiss, "it's our turn to be an island."

Arch nodded. "This development is a landing field—or call it an airstrip."

"A refueling point, is our guess," Weiss said. "There are . . . things buried in the park. Storage tanks, maybe. Traces of radioactivity leaking out."

"But our house," Nancy said, bewildered. "What does our house have to do with it?"

"Our house," Arch said, "is simply a beacon. Like a radar beacon, only it works by some different principle. It sends some kind of impulse out into space to guide their craft to the airstrip."

Nancy ran her hands through her hair. "I don't understand it. If they wanted a refueling point, why didn't they just build one? Why disguise it with houses?"

"Camouflage," said Major Weiss, simply. "Not only to hide it from their enemy, but to hide it from us. Imagine what would happen if funny-looking guys landed in flying saucers and started setting up funny-looking equipment. The world would be in an uproar. The equipment would probably be destroyed before it had been standing half an hour."

"My guess" said Arch, "is that one of them got to old Herb Ketchum, the builder, and offered him something he wanted very much. Jewels maybe, or some gadget out of their technology that he could use—like the time I gave my cigarette lighter to an islander. In return he built the development according to their layout plan and let them tinker with it."

"I still don't understand," Nancy said. "If they're that much ahead of us in science, why didn't they just force us to play host to their airstrip?"

"Maybe they figured it was cheaper this way," the major suggested. "It'd be mighty expensive to hold an airstrip on a hostile island. Maybe they're short of men. Maybe they just wanted to avoid violence."

Arch made circles on the coffee table with his glass. "I can't help thinking," he said, "that they've done better by us than we did by the islanders. Since nothing has landed in the park since it was built, maybe it's just for emergencies. Maybe they hope they'll never have to use it. So they're trying to use our island with the least possible dislocation for us islanders."

"You think they're good Joes, uh?" the major said.

"Just a feeling," Arch answered. "Their whole attempt to hide their airstrip could mean that they don't want to involve us in their war. But"—he grinned at Nancy—"they didn't know about woman's intuition."

She smiled. "Not intuition. Just an eye for detail."

"Call it what you like. I'd never have noticed anything in a hundred years."

Nancy stood up suddenly and walked to the window. "I just can't believe it!" she protested. She whirled to face the major. "How do you know it's a war? Maybe they're just exploring, far from their homes. Maybe that's why they need a fueling point."

The major shrugged. "Could be. But if they're exploring, why haven't they explored us? Why haven't they tried to talk to us? This whole thing smacks of a job done in a hurry. Like us, out in the Pacific. We found out enough about each island to do our job—no more—then built our strip."

Little Archie ran into the room at that moment and vaulted into the major's lap. The major gave him a snappy salute. "Hello, corporal."

"Come and see my airplane garage," Archie ordered.

Major Weiss stood up, hefting the boy against his shoulder. "Duty calls," he explained to Arch and Nancy, and disappeared into the playroom.

Later, when dinner was over and the children were in bed, Arch and the major walked outside. "Been dying for a cigar," the major said, fumbling in his pocket. "Never smoke them indoors; women object. Guess that's why I never got married. Have one?"

"No, thanks."

While the major lit up, Arch formed the question that had burned in his mind all evening. "When you take over my house, major," he said, "what are you going to do: keep the beacon operating or rip it apart?"

Major Weiss blew a cloud at the stars. "I've been thanking my great good luck," he said, "that that is one decision I won't have to make."

"Who'll make it?"

"Top level. The very top." Weiss stoked up his cigar for a few seconds, then took it out of his mouth. "You can see the problem. If we keep it operating, and if our guess about a war is correct, one day their enemy might find it. Then—boom. On the other hand, where would those Pacific islanders be today if they'd sabotaged our airstrips and kept us out?"

"Under a dictatorship, probably."

"Sure. Of course, this is going to be a guessing game all the way. We don't have facts, and we can't just pretend the whole thing is a dream, so we've got to guess. I'm glad I'm not the guy who has to draft up the official guesswork, but if I were, I'd do it this way: So far, the guys who set up this fueling point have done nothing to indicate they're gangsters. Until they do something to change my mind, I'll guess they're on our side. I'll take the idea of a war as a working hypothesis. I can't even guess what their enemy is like, but I'll bear in mind one possibility about him—he may be out to grab all he can get, including us."

"So we'd cut our own throats if we tore down the beacon."

The major's cigar glowed briefly in the darkness, then dimmed. "As I said, I'm glad I just work here. The guy who makes the decision is really going to earn his pay."

Arch looked up at the stars, hanging in vast silence overhead. "I hope our side wins," he said, fervently.

"I kind of hope," said the major, "that we never get close enough to find out." ■

the analytical laboratory

DECEMBER 1964

PLACE	STORY	AUTHOR	POINTS
1.	Sweet Dreams, Sweet Princes (Conclusion)	*Mack Reynolds*	2.47
2.	Contrast	*Christopher Anvil*	2.88
3.	Plague on Kryder II	*Murray Leinster*	3.17
4.	Shortstack	*Walt and Leigh Richmond*	3.71
5.	Rescue Operation	*Harry Harrison*	4.02
6.	The Equalizer	*Norman Spinrad*	4.32

THE EDITOR

THE PROPHET OF DUNE

Part III of V.

The most terrible conqueror—
the most deadly scourge—
Earth ever knew was a man who, as a boy,
was orphaned and driven out
into the wastelands, with both Man and
Nature against his survival.
Beating such odds is wildly improbable.
But then, so are the Genghis Khans . . .
and the Muad'Dibs!

FRANK HERBERT

Illustrated by: John Schoenherr

Synopsis

Paul Atreides, a duke at the age of fifteen, still is a fugitive with his mother on the face of Arrakis, the desert planet of Dune. The price on Paul's head, placed there by his father's murderer, Baron Vladimir Harkonnen, still is ten billion solaris. And the Harkonnens with their treacherous Imperial Sardaukar warriors remain in power on the planet, in control of its golden prize, the one-crop melange *spice that prolongs life and is unique to Arrakis.*

But Paul has now acquired the dread name of his prescient vision—Muad'Dib. In taking that name, Paul accepted with his mother the countenance of a Fremen troop leader, Stilgar, and killed in single combat a member of Stilgar's troop named Jamis.

Paul has met here, too, Chani, daughter of Liet. She is a young woman whose face haunts the infinite futures of his prescient visions. Once, on far away Caladan where Paul was born, he recalls that he told the Reverend Mother Gaius Helen Mohiam about the vision of Chani.

But Chani's father, the Planetologist Liet-Kynes, is now dead—murdered by the Harkonnens who left him to die in the boiling sand produced by a natural cycle of Arrakeen life—Little Makers producing a CO_2 *eruption as they encounter a water rupture deep under the desert. In his death, Liet-Kynes relives the secret plan for Arrakis—to use humans as a constructive ecological force in changing the planet's surface, producing open water with plant and forest domains. But Liet-Kynes sees in the moment of his death that Arrakis has encountered a tragedy: it has the substance of a hero in Paul Atreides.*

Paul sees some of this for himself and would prevent it if he could. But he is now Paul-Muad'Dib who has slain Jamis and gone through the funeral ceremony as "a friend of Jamis." He sees profound potential in the Fremen, but they are at the core of the wild religious crusade he glimpses just over the horizon of his Time vision.

To the Lady Jessica, Paul's mother, their situation contains a different potential. She sees the Fremen as a source of personal power for Paul, a weapon to regain his ducal fief. (Although she fears Paul's hints that he would aim for the Imperial throne through marriage to a princess daughter of the Emperor Shaddam IV.)

With cynical opportunism, Jessica uses the cant planted among the Fremen by her own Bene Gesserit Missionaria Protectiva. *She casts the prayer of the* salat *in Fremen terms and wins a place among them as a seeress, a member of the Sayyadina.*

Jessica thrusts the past out of her emotions to concentrate on their immediate needs, a home for her unborn daughter, sanctuary for Paul and herself in this deadly land. She can spare no time now to hate the Harkonnens or grieve for her dead Leto, Paul's father, and Leto's companions—the slain swordmaster, Duncan Idaho; the mentat, *Thufir Hawat, who is a captive of the Harkonnens, or the minstrel-warrior, Gurney Halleck, who has accepted sanctuary with Arrakeen spice smugglers. Jessica* *must focus all of her deep Bene Gesserit training on the urgent survival needs of the moment—and she is aware that Paul is in danger from too close association with Fremen women.*

Paul, brooding on the infinite lives he has lived in prescience, in psychological turmoil because of his own strangeness, is borne down by the weight of those infinite futures and finds his thoughts dominated by the single revelation:

My mother is my enemy!

Part 3

XIII

The concept of progress *acts as a protective mechanism to shield us from the terrors of the future.*

"Collected Sayings of Muad'Dib"
by The Princess Irulan

On his seventeenth birthday, Feyd-Rautha Harkonnen killed his one hundredth slave-gladiator in the Family Games. Visiting observers from the Imperial Court—a Count and Lady Fenring—were on the Harkonnen homeworld of Giedi Prime for the event, invited to sit that afternoon with the Immediate Family in the golden box above the triangular arena.

In honor of the na-Baron's nativity and to remind all Harkonnens and subjects that Feyd-Rautha was heir-designate, it was holiday on Giedi Prime. The old Baron had decreed a meridian-to-meridian rest from labors and effort had been spent in the Family city of Harko to create the illusion of gaiety: flags flew from buildings, new paint had been splashed on walls along Court Way.

But off the main Way, Count Fenring and his Lady noted the rubbish heaps, the scabrous brown walls reflected in the dark puddles of the streets, and the furtive scurrying of the people.

In the Baron's blue-walled keep, there was fearful perfection, but the Count and his Lady saw the price being paid—guards everywhere and weapons with that special sheen which told a trained eye they were in regular use. There were check points for routine passage from area to area even within the keep. The servants revealed their military training in the way they walked, in the set of their shoulders . . . in the way their eyes watched and watched and watched.

"The pressure's on," the Count hummed to his Lady in their secret language. "The Baron is just beginning to see the price he really paid to rid himself of the Duke Leto."

"Sometime, I must recount for you the legend of the Phoenix," she said.

They were in the reception hall of the keep waiting to go to the Family Games. It was not a large hall—perhaps forty meters long and half that in width—but false pillars along the sides had been shaped with an abrupt taper, and the ceiling had a subtle arch, all giving the illusion of much greater space.

"Ahhh, here comes the Baron," the Count said.

The Baron moved down the length of the hall with that peculiar waddling-glide imparted by the necessities of guiding suspensor-hung weight. His jowls bobbed up and down; the suspensors jiggled and shifted beneath his orange robe. Rings glittered on his hands and *opafires* shone where they had been woven into the robe.

At the Baron's elbow walked Feyd-Rautha. His dark hair was dressed in close ringlets that seemed incongruously gay above sullen eyes. He wore a tight-fitting black tunic and snug trousers with a suggestion of bell at the bottom. Soft-soled slippers covered his small feet.

Lady Fenring, noting the young man's poise and the sure flow of muscles beneath the tunic, thought: *Here's one who won't let himself go too fat.*

The Baron stopped in front of them, took Feyd-Rautha's arm in a possessive grip, said: "My nephew, the na-Baron, Feyd-Rautha Harkonnen." And turning his baby-fat face toward Feyd-Rautha, he said: "The Count and Lady Fenring of whom I've spoken."

Feyd-Rautha dipped his head with the required courtesy. He stared at the Lady Fenring. She was golden-haired and willowy, her perfection of figure clothed in a flowing gown of ecru—simple fitness of form without ornament. Gray-green eyes stared back at him. She had that Bene Gesserit serene repose about her that the young man found subtly disturbing.

"Ummmm-ah-hmmmm," said the Count. He studied Feyd-Rautha. "The, hmmm, *precise* young man, ah, my . . . hmmmm . . . dear?" The Count glanced at the Baron. "My dear Baron, you say you've spoken of us to this *precise* young man? What did you say?"

"I told my nephew of the great esteem our Emperor holds for you, Count Fenring," the Baron said. And he thought: *Mark him well, Feyd! A killer with the manners of a rabbit—this is the most dangerous kind.*

"Of course!" said the Count, and he smiled at Lady Fenring.

Feyd-Rautha found the man's actions and words almost insulting. They stopped just short of something overt that would require notice. The young man focused his attention on the Count: a small man, weak-looking. The face was weaselish with overlarge dark eyes. There was gray at the temples. And his movements—he moved a hand or turned his head one way, then he spoke another way. It was difficult to follow.

"Ummmm-ahhh-hmmm, you come upon such, mmm, preciseness so rarely," the Count said, addressing the Baron's shoulder. "I . . . ahh, congratulate you on the hmm perfection of your a-h-h-h heir. In the light of the hmmm elder, one might say."

"You are too kind," the Baron said. He bowed, but Feyd-Rautha noted that his uncle's eyes did not agree with the courtesy.

"When you're mmmm ironic, that ahhh suggests you're hmmmm thinking deep thoughts," the Count said.

There he goes again, Feyd-Rautha thought. *It sounds like he's being insulting, but there's nothing you can call out for satisfaction.*

Listening to the man gave Feyd-Rautha the feeling his head was being pushed through mush . . . *ummm-ahhh-hmmmm!* Feyd-Rautha turned his attention back to the Lady Fenring.

"We're ahhh taking up too much of this young man's time," she said. "I understand he's to appear in the arena today."

By the houris of the Imperial harem, she's a lovely one! Feyd-Rautha thought. He said: "I shall make a kill for you this day, My Lady. I shall make the dedication in the arena, with your permission."

She returned his stare serenely, but her voice carried whiplash as she said: "You do *not* have my permission."

"Feyd!" the Baron said. And he thought: *That imp! Does he want this deadly Count to call him out?*

But the Count only smiled and said: "Hmmmm-ummm."

"You really *must* be getting ready for the arena, Feyd," the Baron said. "You must be rested and not take any foolish risks."

Feyd-Rautha bowed, his face dark with resentment. "I'm sure everything will be as you wish, Uncle." He nodded to Count Fenring: "Sir," To the Lady: "My Lady." And he turned, strode out of the hall, barely glancing at the knot of Families Minor near the double doors.

"He's so young," the Baron sighed.

"Ummmm-ahh indeed hmmm," the Count said.

And the Lady Fenring thought: *Can that be the young man the Reverend Mother meant?* Is that *a bloodline we must preserve?*

"We've more than an hour before going to the arena," the Baron said. "Perhaps we could have our little talk now, Count Fenring." He tipped his gross head to the right. "There's a considerable amount of progress to be discussed."

And the Baron thought: *Let us see now how the Emperor's errand boy gets across whatever message he carries without ever being so crass as to speak it right out.*

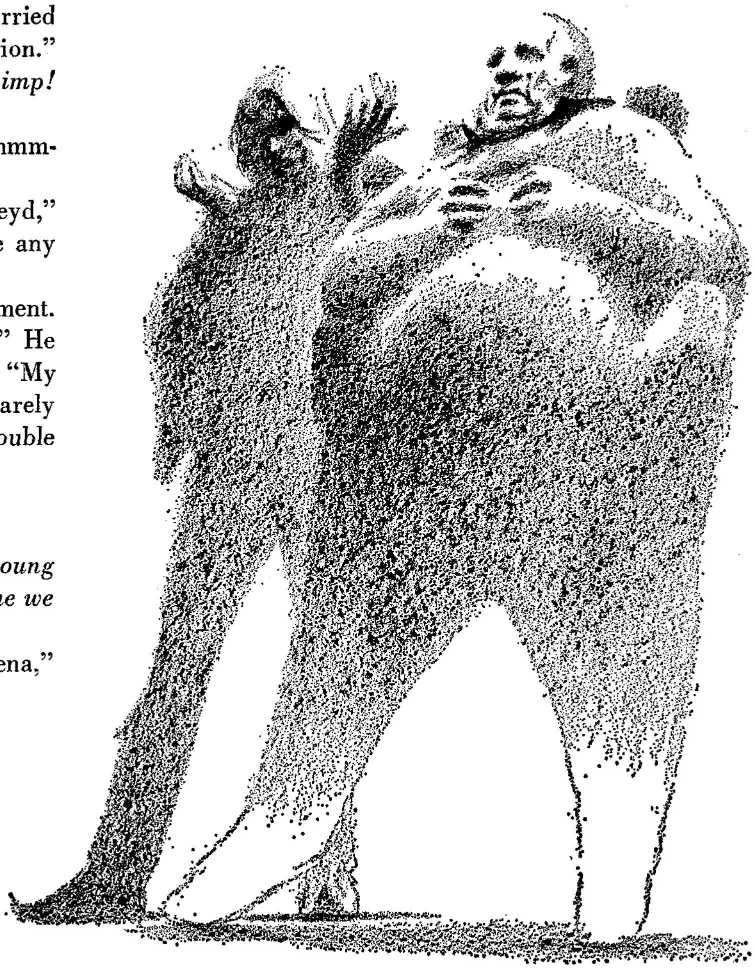
The Count spoke to his Lady: "Ummmm-ahhh-hmmm, you mmm will ahh excuse us, my dear?"

"Each day, sometimes each hour, brings change," she said. "Mmmmm." And she smiled sweetly at the Baron before turning away. Her long skirts swished and she walked with a straight-backed regal stride toward the double doors at the end of the hall.

The Baron noted how all conversation among the Houses Minor there stopped at her approach, how the eyes followed her. *Bene Gesserits!* the Baron thought. *The universe would be better rid of them all!*

"There's a cone of silence between two of the pillars over here on our left," the Baron said. "We can talk there without fear of being overheard." He led the way with his waddling gait into the sound-deadening field, feeling the noises of the keep become dull and distant.

The Count moved up beside the Baron, and they turned, facing the wall so their lips could not be read.



"We're not satisfied with the way you ordered the Sardaukar off Arrakis," the Count said.

Straight talk! the Baron thought.

"The Sardaukar could not stay longer without risking that *others* would find how the Emperor helped me," the Baron said.

"But your nephew Rabban does not appear to be pressing strongly enough toward a solution of the Fremen problem."

"What does the Emperor wish?" the Baron asked. "There cannot be more than a handful of Fremen left on Arrakis. The southern desert is uninhabitable. The northern desert is swept regularly by our patrols."

"Who says the southern desert is uninhabitable?"

"Your own planetologist said it, my dear Count."

"But Dr. Kynes is dead."

"Ah, yes . . . unfortunate, that."

"We've word from an overflight across the southern reaches," the Count said. "There's evidence of plant life."

"Has the Guild then agreed to a watch from space?"

"You know better than that, Baron. The Emperor cannot legally post a watch on Arrakis."

"And *I* cannot afford it," the Baron said. "Who made this overflight?"

"A . . . smuggler."

"Someone has lied to you, Count," the Baron said. "Smugglers cannot navigate the southern reaches any better than can Rabban's men. Storms, sand-static and all that, you know. Navigation markers are knocked out faster than they can be installed."

"We'll discuss various types of static another time," the Count said.

Ahhh, the Baron thought. "Have you found some mistake in my accounting then?" he demanded.

"When you imagine mistakes there can be no self-defense," the Count said.

He's deliberately trying to arouse my anger, the Baron thought. He took two deep breaths to calm himself. He could smell his own sweat, and the harness of the suspensors beneath his robe felt suddenly itchy and galling.

"The Emperor cannot be unhappy about the death of the concubine and the boy," the Baron said. "They fled into the desert. There was a storm."

"Yes, there were so many convenient accidents," the Count agreed.

"I do not like your tone, Count," the Baron said.

"Anger is one thing, violence another," the Count said. "Let me caution you: Should an unfortunate accident occur to me here the Great Houses all would learn what you did on Arrakis. They've long suspected how you do business."

"The only recent business I can recall," the Baron said, "was transportation of several legions of Sardaukar to Arrakis."

"You think you could hold that over the Emperor's head?"

"I wouldn't think of it!"

The Count smiled. "Sardaukar commanders could be found who'd confess they acted without orders because they wanted a battle with your Fremen scum."

"Many might doubt such a confession," the Baron said, but the threat staggered him. Were Sardaukar truly that disciplined? he wondered.

"The Emperor does wish to audit your books," the Count said.

"Any time."

"You . . . ahh, have no objections?"

"None. My CHOAM Company directorship will bear the closest scrutiny." And he thought: *Let him bring a false accusation against me and have it exposed. I shall stand there, promethean, saying: "Behold me, I am wronged." Then let him bring any other accusation against me, even a true one. The Great Houses will not believe a second attack from an accuser once proved wrong.*

"No doubt your books will bear the closest scrutiny," the Count muttered.

"Why is the Emperor so interested in exterminating the Fremen?" the Baron asked.

"You wish the subject to be changed, eh?" The Count shrugged. "It is the Sardaukar who wish it, not the Emperor. They needed practice in killing . . . and they hate to see a task left undone."

Does he think to frighten me by reminding me that he is supported by those bloodthirsty killers? the Baron wondered.

"A certain amount of killing has always been an arm of business," the Baron said, "but a line has to be drawn somewhere. Someone must be left to work the spice."

The Count emitted a short, barking laugh. "You think you can harness the Fremen?"

"There never were enough of them for that," the Baron said. "But the killing has made the rest of my population uneasy. It's reaching the point where I'm considering another solution to the Arrakeen problem, my dear Fenring. And I must confess the Emperor deserves credit for the inspiration."

"Ahhh?"

"You see, Count, I have the Emperor's prison planet, Salusa Secundus, to inspire me."

The Count stared at him with glittering intensity. "What possible connection is there between Arrakis and Salusa Secundus?"

The Baron felt the alertness in Fenring's eyes, said: "No connection yet."

"Yet?"

"You must admit it'd be a way to develop a substantial work force on Arrakis—use the place as a prison planet."

"You anticipate an increase in prisoners?"

"There has been unrest," the Baron admitted. "I've had to squeeze rather severely, Fenring. After all, you know the price I paid that damnable Guild to transport our mutual force to Arrakis. That money has to come from *somewhere.*"

"I suggest you not use Arrakis as a prison planet without the Emperor's permission, Baron."

"Of course not," the Baron said, and he wondered at the sudden chill in Fenring's voice.

"Another matter," the Count said. "We learn that Duke Leto's Mentat, Thufir Hawat, is not dead but in your employ."

"I could not bring myself to waste him," the Baron said.

"You lied to our Sardaukar commander when you said Hawat was dead."

"Only a white lie, my dear Count. I hadn't the stomach for a long argument with the man."

"Was Hawat the real traitor?"

"Oh, goodness, no! It was the false doctor." The Baron wiped at perspiration on his neck. "You must understand, Fenring, I was without a Mentat. You know that. I've never been without a Mentat. It was most unsettling."

"How could you get Hawat to shift allegiance?"

"His Duke was dead." The Baron forced a smile. "There's nothing to fear from Hawat, my dear Count. The Mentat's flesh has been impregnated with a latent poison. We administer an antidote in his meals. Without the antidote, the poison is triggered—he'd die in a few days."

"Withdraw the antidote," the Count said.

"But he's useful!"

"And he knows too many things no living man should know."

"You said the Emperor doesn't fear exposure."

"Don't play games with me, Baron!"

"When I see such an order above the Imperial Seal I'll obey it," the Baron said. "I'll not submit to your whim."

"You think it whim?"

"What else can it be? The Emperor has obligations to me, too, Fenring. I rid him of the troublesome Duke."

"With the help of a few Sardaukar."

"Where else would the Emperor have found a House to provide the disguising uniforms to hide his hand in this matter?"

"He has asked himself the same question, Baron, but with a slightly different emphasis."

The Baron studied Fenring, noting the stiffness of jaw muscles, the careful control. "Ahhh, now," the Baron said. "I hope the Emperor doesn't believe he can move against *me* in total secrecy."

"He hopes it won't become necessary."

"The Emperor cannot believe I threaten him!" The Baron permitted anger and grief to edge his voice, thinking: *Let him wrong me in that! I could place myself on the throne while still beating my breast over how I'd been wronged.*

The Count's voice went dry and remote as he said: "The Emperor believes what his senses tell him."

"Dare the Emperor charge me with treason before a full Landsraad Council?" And the Baron held his breath with the hope of it.

"The Emperor need *dare* nothing."

The Baron whirled away in his suspensors to hide his expression. *It could happen in my lifetime!* he thought. *Emperor! Let him wrong me! Then—the bribes and coercion, the rallying of the Great Houses: they'd flock to my banner like peasants running for shelter. The thing they fear above all else is the Emperor's Sardaukar loosed upon them one House at a time.*

"It's the Emperor's sincere hope he'll never have to charge you with treason," the Count said.

The Baron found it difficult to keep irony out of his voice and permit only the expression of hurt, but he managed. "I've been a most loyal subject. These words hurt me beyond my capacity to express."

"Ummmm-ahh-hmmm," said the Count.

The Baron kept his back to the Count, nodding. Presently, he said: "It's time to go to the arena."

"Indeed," said the Count.

They moved out of the cone of silence and, side by side, walked toward the clumps of Houses Minor at the end of the hall. A bell began a slow tolling somewhere in the keep—twenty minutes warning for the arena gathering.

"The Houses Minor wait for you to lead them," the Count said, nodding toward the people they approached.

Double meaning . . . double meaning, the Baron thought.

He looked up at the new talismen flanking the exit to his hall—the mounted bull's head and the oil painting of the Old Duke Atreides, the late Duke Leto's father. They filled the Baron with an odd sense of foreboding, and he wondered what thoughts these talismen had inspired in the Duke Leto as they hung in the halls of Caladan and then on Arrakis—the bravura father and the head of the bull that had killed him.

"Mankind has ahh only one mmm science," the Count said as they picked up their parade of followers and emerged from the hall into the waiting room—a narrow space with high windows and floor of patterned white and purple tile.

"And what science is that?" the Baron asked.

"It's the ummm-ahh science of ahhh discontent," the Count said.

The Houses Minor behind them, sheep-faced and responsive, laughed with just the right tone of appreciation, but the sound carried a note of discord as it collided with the sudden blast of motors that came to them when pages threw open the outer doors, revealing the line of ground cars, their guidon pennants whipping in a breeze.

The Baron raised his voice to surmount the sudden noise, said: "I hope you'll not be discontented with the performance of my nephew today, Count Fenring."

"I ahh am filled ummm only with a hmmm sense of anticipation, yes," the Count said. "Always in the ahh *proces verbal*, one ummm-ahhh must consider the ahh office of origin."

The Baron hid his sudden stiffening of surprise by stumbling on the first step down from the exit. *Proces verbal! That was a report of a crime against the Imperium!*

But the Count chuckled to make it seem a joke, and patted the Baron's arm.

All the way to the arena, though, the Baron sat back among the armored cushions of his car, casting covert glances at the Count beside him, wondering why the Emperor's *errand boy* had thought it necessary to make that particular kind of joke in front of the Houses Minor. It was obvious that Fenring seldom did anything he felt to be unnecessary, nor used two words where one would do, nor held himself to a single meaning in a single phrase.

They were seated in the golden box above the triangular arena—horns blaring, the tiers above and around them jammed with a hubbub of people and waving pennants—when the answer came to the Baron.

"My dear Baron," the Count said, leaning close to his ear, "you know, don't you, that the Emperor has not given official sanction to your choice of heir?"

The Baron felt himself to be within a sudden personal cone of silence produced by his own shock. He stared at Fenring, barely seeing the Count's Lady come through the guards beyond to join the party in the golden box.

"That's really why I'm here today," the Count said. "The Emperor wishes me to report on whether you've chosen a worthy successor. There's nothing like the arena to expose the true person from beneath the mask, eh?"

"The Emperor promised me free choice of heir!" the Baron grated.

"We shall see," Fenring said, and turned away to greet his Lady. She sat down, smiling at the Baron, then giving her attention to the sand floor beneath them where Feyd-Rautha was emerging in giles and tights—the black glove and the long knife in his right hand, the white glove and the short knife in his left hand.

"White for poison, black for purity," the Lady Fenring said. "A curious custom, isn't it, my love?"

"Ummmm," the Count said.

The greeting cheer lifted from the Family galleries, and Feyd-Rautha paused to accept it, looking up and scanning the faces—seeing his cousins, the demibrothers, the concubines and out-freyn relations. They were so many pink trumpet mouths yammering amidst a flutter of colorful clothing and banners.

It came to Feyd-Rautha then that the packed ranks of faces would look just as avidly at his blood as at that of the slave-gladiator. There was not a doubt of the outcome in this fight, of course. Here was only the form of danger without its substance—yet.

Feyd-Rautha held up his knives to the sun, saluted the three corners of the arena in the ancient manner. The short knife in white-gloved hand—white, the sign of poison—went first into its sheath. Then the long blade in the black-gloved hand—the pure blade that now was unpure, his secret weapon to turn this day into a purely personal victory: poison on the black blade.

The adjustment of his body shield took only a moment, and he paused to sense the skin-tightening at his forehead assuring him he was properly guarded.

This moment carried its own suspense, and Feyd-Rautha dragged it out with the sure hand of a showman, nodding to his handlers and distractors, checking their equipment with a measuring stare—gyves in pace with their prickles sharp and glistening, the barbs and hooks waving with their blue streamers.

Feyd-Rautha signaled the musicians.

The slow march began, sonorous with its ancient pomp, and Feyd-Rautha led his troupe across the arena for obeisance at the foot of his uncle's box. He caught the ceremonial key as it was thrown.

The music stopped.

Into the abrupt silence, he stepped back two paces, raised the key and shouted: "I dedicate this truth to . . ." And he hesitated, knowing his uncle would think: *The young fool's going to dedicate to Lady Fenring after all and cause a ruckus!*

". . . To my uncle and patron, the Baron Vladimir Harkonnen!" Feyd-Rautha shouted.

And he was delighted to see his uncle sigh.

The music resumed at the quick-march, and Feyd-Rautha led his men scampering back across the arena to the prudence-door that admitted only those wearing the proper identification band. Feyd-Rautha prided himself that he never used the pru-door and seldom needed distractors. But it was good to know they were available this day—special plans sometimes involved special dangers.

Again, silence settled over the arena.

Feyd-Rautha turned, faced the big red door across from him where the gladiator would emerge.

The special gladiator.

The plan Thufir Hawat had devised was admirably simple and direct, Feyd-Rautha thought. The slave would not be drugged—that was the danger. Instead, a key word had been drummed into the man's unconscious to immobilize his muscles at a critical instant. Feyd-Rautha rolled the vital word in his mind, mouthing it without sound: "*Scum!*" To the audience, it would appear that an undrugged slave had been slipped into the arena to kill the na-Baron. And all the carefully arranged evidence would point to the slavemaster.

A low humming arose from the red door's servo-motors as they were armed for opening.

Feyd-Rautha focused all his awareness on the door. This first moment was the critical one. The appearance of the gladiator as he emerged told the trained eye much it needed to know. All gladiators were supposed to be hyped on *elacca* drugs to come out kill-ready in fighting stance—but you had to watch how they hefted the knife, which way they turned in defense, whether they were actually aware of the audience in the stands. The way a slave cocked his head could give the most vital clue to counter and feint.

The red door slammed open.

Out charged a tall, muscular man with shaved head and darkly pitted eyes. His skin was carrot-colored as it should be from the elacca drugs, but Feyd-Rautha knew the color was paint. The slave wore green leotards and the red belt of a semi-shield—the belt's arrow pointing left to indicate the slave's left side was shielded. He held his knife sword-fashion, cocked slightly outward in the stance of a trained fighter. Slowly, he advanced into the arena, turning his shielded side toward Feyd-Rautha and the group at the pru-door.

"I like not the look of this one," said one of Feyd-Rautha's barb-men. "Are you sure he's drugged, M'Lord?"

"He has the color," Feyd-Rautha said.

"Yet he stands like a fighter," said another helper.

Feyd-Rautha advanced two steps onto the sand, studied this slave.

"What has he done to his arm?" asked one of the distractors.

Feyd-Rautha's attention went to a bloody scratch on the man's left forearm, followed the arm down to the hand as it pointed to a design drawn in blood on the left hip of the green leotards—a wet shape there: the formalized outline of a hawk.

Hawk!

Feyd-Rautha looked up into the darkly pitted eyes, saw them glaring at him with an uncommon alertness.

It's one of the Duke Leto's fighting men we took on Arrakis! Feyd-Rautha thought. *No simple gladiator this!* A chill ran through him, and he wondered if Hawat had planned another plan for this arena—a feint within a feint within a feint. And only the slavemaster prepared to take the blame!

Feyd-Rautha's chief handler spoke at his ear: "I like not the look on that one, M'Lord. Let me set a barb or two in his knife arm to try him."

"I'll set my own barbs," Feyd-Rautha said. He took a pair of the long hooked shafts from the handler, hefted them, testing the balance. These barbs, too, were supposed to be drugged—but not this time, and the chief handler might die because of that. But it was all part of the plan.

"You'll come out of this a hero," Hawat had said. *"Killed your gladiator man to man and in spite of treachery. The slavemaster will be executed and your man will step into his spot."*

Feyd-Rautha advanced another five paces into the arena, playing out the moment, studying the slave. Already, he knew, the experts in the stands above him were aware that something was wrong. The gladiator had the correct skin color for a *druggee*, but he stood his ground and did not tremble. The aficionados would be whispering among themselves now: *"See how he stands. He should be agitated—attacking or retreating. See how he conserves his strength, how he waits. He should not wait."*

Feyd-Rautha felt his own excitement kindle. *Let there be treachery in Hawat's mind,* he thought. *I can handle this slave. And it's my long knife that carries the poison this time, not the short one. Even Hawat doesn't know that.*

"Hai, Harkonnen!" the slave called. "Are you prepared to die?"

Deathly stillness gripped the arena. *Slaves did not issue the challenge!*

Now, Feyd-Rautha had a clear view of the gladiator's eyes, saw the cold ferocity of despair in them. He marked the way the man stood, loose and ready, muscles prepared for victory. The slave grapevine had passed Hawat's message to this one: *"You'll get a true chance to kill the na-Baron."* That much of the scheme was as they'd planned it, then.

A tight smile crossed Feyd-Rautha's mouth. He lifted the barbs, seeing success for his plans in the way the gladiator stood.

"Hai! Hai!" the slave challenged, and crept forward two steps.

No one in the galleries can mistake it now, Feyd-Rautha thought.

This slave should have been partly crippled by drug-induced terror. Every movement should have betrayed his inner knowledge that there was no hope for him—he could not win. He should have been filled with the stories of the poisons the na-Baron chose for the blade in his white-gloved hand. The na-Baron never gave quick death, he delighted in demonstrating rare poisons, could stand in the arena pointing out interesting side effects on a writhing victim. There was fear in the slave, yes—but not terror.

Feyd-Rautha lifted the barbs high, nodded in an almost-greeting.

The gladiator pounced.

His feint and defensive counter were as good as any Feyd-Rautha had ever seen. A timed side blow missed by the barest fraction from severing the tendons of the na-Baron's left leg.

Feyd-Rautha danced away leaving a barbed shaft in the slave's right forearm, the hooks completely buried in flesh where the man could not withdraw them without ripping tendons.

A concerted gasp lifted from the galleries.

The sound filled Feyd-Rautha with elation.

He knew now what his uncle was experiencing, sitting up there with the Fenrings, the observers from the Imperial Court, beside him. There could be no interference with this fight. The forms must be observed in front of witnesses. And the Baron would interpret the events in the arena only one way—threat to himself.

The slave backed, holding knife in teeth and lashing the barbed shaft to his arm with the pennant. "I do not feel your needle!" he shouted. Again, he crept forward, knife ready, left side presented, his body bent backward to give it the greatest surface of protection from the half-shield.

That action, too, didn't escape the galleries. Sharp cries came from the family boxes. Feyd-Rautha's handlers were calling out to ask if he needed them.

He waved them back to the pru-door.

I'll give them a show such as they've never had before, Feyd-Rautha thought. *No tame killing where they can sit back and admire the style. This'll be something to take them by the guts and twist them. When I'm Baron they'll remember this day and won't be a one of them can escape fear of me because of this day.*

Feyd-Rautha gave ground slowly before the gladiator's crablike advance. Arena sand grated underfoot. He heard the slave's panting, smelled his own sweat and a faint odor of blood on the air.

Steadily, the na-Baron moved backward, turning to the right, his second barb ready. The slave danced sideways. Feyd-Rautha appeared to stumble, heard the scream from the galleries.

Again, the slave pounced.

Gods, what a fighting man! Feyd-Rautha thought as he leaped aside. Only youth's quickness saved him, but he left the second barb buried in the deltoid muscle of the slave's right arm.

Shrill cheers rained from the galleries.

They cheer me now, Feyd-Rautha thought. He heard the wildness in the voices just as Hawat had said he would. They'd never cheered a Family fighter that way before. And he thought with an edge of grimness on a thing Hawat had told him: *"It's easier to be terrified by an enemy you admire."*

Swiftly, Feyd-Rautha retreated to the center of the arena where all could see clearly. He drew his short blade, crouched and waited for the advancing slave.

The man took only the time to lash the second barb tight to his arm, then sped in pursuit.

Let the Family see me do this thing, Feyd-Rautha thought. *I am their enemy: let them think of me as they see me now.*

He drew his short blade, crouched and waited for the slave.

"I do not fear you, Harkonnen swine," the gladiator said. "Your tortures cannot hurt a dead man. I can be dead on my own blade before a handler lays finger to my flesh. And I'll have you dead beside me!"

Feyd-Rautha grinned, offered now the long blade, the one with the poison. "Try this one," he said, and feinted with the short blade in his other hand.

The slave shifted knife hands, turned inside both parry and feint to grapple the na-Baron's short blade—the one in the white gloved hand that tradition said should carry the poison.

"You will die, Harkonnen," the gladiator gasped.

They struggled sideways across the sand. Where Feyd-Rautha's shield met the slave's half-shield, a blue glow marked the contact. The air around them filled with ozone from the fields.

"Die on your own poison!" the slave grated.

He began forcing the white-gloved hand inward, turning the blade he thought carried the poison.

Let them see this! Feyd-Rautha thought. He brought down the long blade, felt it clang uselessly against the barbed shaft lashed to the slave's arm.

Feyd-Rautha felt a moment of desperation. He had not thought the barbed shafts would be an advantage for the slave. But they gave the man another shield. And the strength of this gladiator! The short blade was being forced inward inexorably, and Feyd-Rautha focused on the fact that a man could also die on an unpoisoned blade.

"Scum!" Feyd-Rautha gasped.

At the key word, the gladiator's muscles obeyed with a momentary slackness. It was enough for Feyd-Rautha. He opened a space between them sufficient for the long blade. Its poisoned tip flicked out, drew a red line down the slave's chest. There was instant agony in the poison. The man disengaged himself, staggered backward.

Now, let my dear Family watch, Feyd-Rautha thought. *Let them think on this slave who tried to turn the knife he thought poisoned and use it against me. Let them wonder how a gladiator could come into this arena ready for such an attempt. And let them always be aware they cannot know for sure which of my hands carries the poison.*

Feyd-Rautha stood in silence, watching the slowed motions of the slave. The man moved within a hesitation-awareness. There was an orthographic thing on his face now for every watcher to recognize. The death was written there. The slave knew what had been done to him and he knew how it had been done. The wrong blade had carried the poison.

"You!" the man moaned.

Feyd-Rautha drew back to give death its space. The paralyzing drug in the poison had yet to take full effect, but the man's slowness told of its advance.

The slave staggered forward as though drawn by a string—one dragging step at a time. Each step was the only step in his universe. He still clutched his knife, but its point wavered.

"One day . . . one . . . of us . . . will . . . get . . . you," he gasped.

A sad little moue contorted his mouth. He sat, sagged, then stiffened and rolled away from Feyd-Rautha, face down.

Feyd-Rautha advanced in the silent arena, put a toe under the gladiator and rolled him onto his back to give the galleries a clear view of the face when the poison began its twisting, wrenching work on the muscles. But the gladiator came over with his own knife protruding from his breast.

In spite of frustration, there was for Feyd-Rautha a measure of admiration for the effort this slave had managed in overcoming the paralysis to do this thing to himself. With the admiration came the realization that here was *truly* a thing to fear.

That which makes a man superhuman is terrifying.

As he focused on this thought, Feyd-Rautha became conscious of the eruption of noise from the stands and galleries around him. They were cheering with utter abandon.

Feyd-Rautha turned, looking up at them.

All were cheering except the Baron, who sat with hand to chin in deep contemplation—and the Count and his Lady, both of whom were staring down at him, their faces masked by smiles.

Count Fenring turned to his Lady, said: "Ahhh-ummm, a resourceful ummmm young man. Eh, mmmm-ahh, my dear?"

"His ahhh synaptic responses are very swift," she said.

The Baron looked at her, at the Count, returned his attention to the arena, thinking: *If someone could get that close to one of mine!* Rage began to replace his fear. *I'll have the slavemaster dead over a slow fire this night . . . and if this Count and his Lady had a hand in it . . .*

The conversation in the Baron's box was remote movement to Feyd-Rautha, the voices drowned in the foot-stamping chant that came now from all around:

"Head! Head! Head! Head!"

The Baron scowled, seeing the way Feyd-Rautha turned to him. Languidly, controlling his rage with difficulty, the Baron waved his hand toward the young man standing in the arena beside the sprawled body of the slave. *Give the boy a head. He earned it by exposing the slavemaster.*

Feyd-Rautha saw the signal of agreement, thought: *They think they honor me. Let them see what I think!*

He saw his handlers approaching with a saw-knife to do the honors, waved them back, repeated the gesture as they hesitated. *They think they honor me with just a head!* he thought. He bent and crossed the gladiator's hands around the protruding knife handle, then removed the knife and placed it in the limp hands.

It was done in an instant, and he straightened, beckoned his handlers. "Bury this slave intact with his knife in his hands," he said. "The man earned it."

In the golden box, Count Fenring leaned close to the Baron said: "A grand gesture, that—true bravura. Your nephew has style as well as courage."

"He insults the crowd by refusing the head," the Baron muttered.

"Not at all," Lady Fenring said. She turned, looking up at the tiers around them.

And the Baron noted the line of her neck—a truly lovely flowing of muscles—like a young boy's.

"They like what your nephew did," she said.

As the import of Feyd-Rautha's gesture penetrated to the most distant seats, as the people saw the handlers carrying off the dead gladiator intact, the Baron watched them and realized she had interpreted the reaction correctly. The people were going wild, beating on each other, screaming and stamping.

The Baron spoke wearily. "I shall have to order a fete. You cannot send people home like this, their energies unspent. They must see that I share their elation." He gave a hand signal to his guard, and a servant above them dipped the Harkonnen orange pennant over the box—once, twice, three times—signal for a fete.

Feyd-Rautha crossed the arena to stand beneath the golden box, his weapons sheathed, arms hanging at his sides. Above the undiminished frenzy of the crowd, he called: "A fete, Uncle?"

The noise began to subside as people saw the conversation and waited.

"In your honor, Feyd!" the Baron called down. And again, he caused the pennant to be dipped in signal.

Across the arena, the pru-barriers had been dropped and young men were leaping down into the arena, racing toward Feyd-Rautha.

"You ordered the pru-shields dropped, Baron?" the Count asked.

"No one will harm the lad," the Baron said. "He's a hero."

The first of the charging mass reached Feyd-Rautha, lifted him on their shoulders, began parading around the arena.

"He could walk unarmed and unshielded through the poorest quarters of Harko tonight," the Baron said. "They'd give him the last of their food and drink just for his company."

The Baron pushed himself from his chair, settled his weight into his suspensors. "You will forgive me, please. There are matters that require my immediate attention. The guard will see you to the keep."

The Count arose, bowed. "Certainly, Baron. We're looking forward to the fete. I've ahhh-mmm, never seen a Harkonnen fete."

"Yes," the Baron said. "The fete." He turned, was enveloped by guards as he stepped into the private exit from the box.

A guard captain bowed to Count Fenring. "Your orders, My Lord?"

"We will ahhh wait for the worst mmmm crush to ummm pass," the Count said.

"Yes M'Lord." The man bowed himself back three paces.

Count Fenring faced his Lady, spoke again in their personal humming-code tongue: "You saw it?"

In the same humming tongue, she said: "The lad

knew the gladiator wouldn't be drugged. There was a moment of fear, yes, but no surprise."

"It was planned," he said. "The entire performance."

"Without a doubt."

"It stinks of Hawat."

"Indeed," she said.

"I demanded earlier that the Baron eliminate Hawat."

"That was an error, my dear."

"I see that now."

"The Harkonnens may have a new Baron ere long."

"If that's Hawat's plan."

"That will bear examination, true," she said.

"The young one will be more amenable to control."

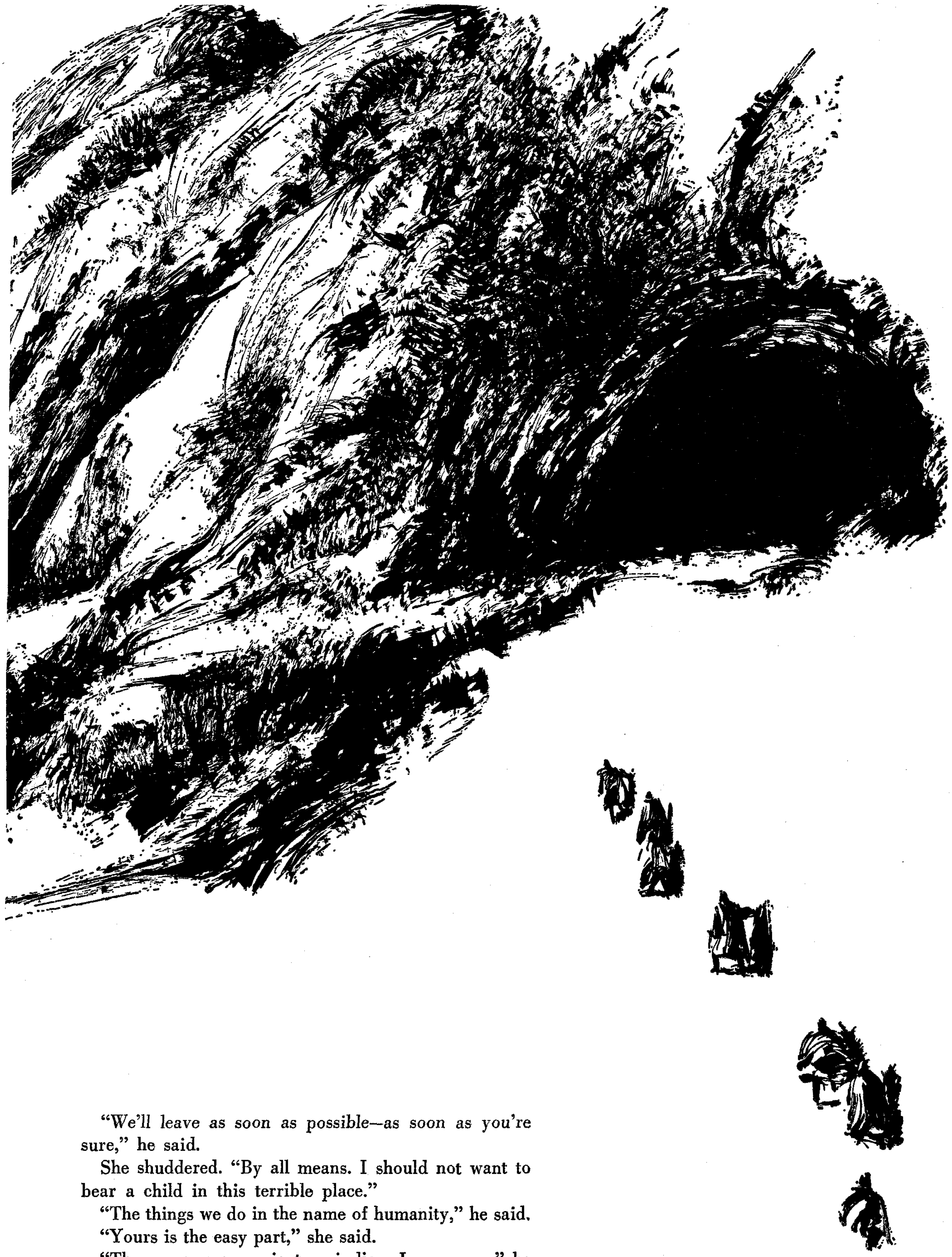
"For us . . . after tonight," she said.

"You don't anticipate difficulty seducing him, my little brood-mother?"

"No, my love. You saw how he looked at me."

"Yes, and I can see now why we must have that bloodline."

"Indeed, and it's obvious we must have a hold on him. I'll plant deep in his deepest self the necessary prana-bindu phrases to bend him."



"We'll leave as soon as possible—as soon as you're sure," he said.

She shuddered. "By all means. I should not want to bear a child in this terrible place."

"The things we do in the name of humanity," he said.

"Yours is the easy part," she said.

"There *are* some ancient prejudices I overcome," he said. "They're quite primordial, you know."

"My poor dear," she said, and patted his cheek. "You know this is the only way to be sure of saving that bloodline."

He spoke in a dry voice: "I quite understand what we do."

"We won't fail," she said.

"Guilt starts as a feeling of failure," he reminded.

"There'll be no guilt," she said. "Hypno-ligation of that Feyd-Rautha's psyche and his child in my womb—then we go."

"That uncle," he said. "Have you ever seen such distortion?"

"He's pretty fierce," she said, "but the nephew could well grow to be worse."

"Thanks to that uncle. You know, when you think what this lad could've been with some other upbringing—with the Atreides code to guide him, for example."

"It's sad," she said.

"Would that we could've saved both the Atreides youth and this one. From what I heard of that young Paul—a most admirable lad, good union of breeding and training." He shook his head. "But we shouldn't waste sorrow over the aristocracy of misfortune."

"There's a Bene Gesserit saying," she said.

"You have sayings for everything!" Count Fenring protested.

"You'll like this one," she said. "It goes: '*Do not count a human dead until you've seen his body. And even then you can make a mistake.*' "

XIV

Muad'Dib tells us in "A Time of Reflection" that his first collisions with Arrakeen necessities were the true beginnings of his education. He learned then how to pole the sand for its weather, learned the language of the wind's needles stinging his skin, learned how the nose can buzz with sand-itch and how to gather his body's precious moisture around him to guard it and preserve it. As his eyes assumed the blue of the Ibad, he learned the Chakobsa Way.

Stilgay's preface to "Muad'Dib, The Man"
by The Princess Irulan

Stilgar's troop returning to the sietch with its two *strays-from-the-desert* climbed out of the basin in the waning light of the first moon. The robed figures hurried with the smell of home in their nostrils. Dawn's gray line behind them was brightest at the notch in their horizon-calendar which marked the middle of autumn, the month of Caprock.

Wind-raked dead leaves strewed the cliffbase where the sietch children had been gathering them, but the sounds of the troop's passage—except for occasional blunderings by Paul and his mother—could not be distinguished from the natural sounds of the night.

Paul wiped sweat-caked dust from his forehead, felt a tug at his arm, heard Chani's voice hissing: "Do as I told you: bring the fold of your hood down over your forehead! Leave only the eyes exposed. You waste moisture."

A whispered command behind them demanded silence: "The desert hears you!"

A bird chirruped from the rocks high above them.

The troop stopped, and Paul sensed abrupt tension.

There came a faint thumping from the rocks, a sound no louder than mice jumping in the sand.

Again, the bird chirruped.

A stir passed through the troop's ranks. And again, the mouse-thumping pecked its way across the sand.

Once more, the bird chirruped.

The troop resumed its climb up into a crack in the rocks, but there was a stillness of breath about the Fremen now that filled Paul with caution, and he noted covert glances toward Chani, the way she seemed to withdraw, pulling in upon herself.

There was rock underfoot now, a faint gray swishing of robes around them, and Paul sensed a relaxing of discipline, but still that *quiet-of-the-person* about Chani and the others. He followed a shadow shape—up steps, a turn, more steps, into a tunnel, past two moisture-sealed doors and into a globe-lighted narrow passage with yellow rock walls and ceiling.

All around him, Paul saw the Fremen throwing back their hoods, removing nose plugs, breathing deeply. Someone sighed. Paul looked for Chani, found that she had left his side. He was hemmed in by a press of robed bodies. Someone jostled him, said: "Excuse me, Usul. What a crush! It's always this way."

On his left, the narrow bearded face of the one called Farok turned toward Paul. The stained eyepits and blue darkness of eyes appeared even darker under the yellow globes. "Throw off your hood, Usul," Farok said. "You're home." And he helped Paul, releasing the hood catch, elbowing a space around them.

Paul slipped out his nose plugs, swung the mouth baffle aside. The odor of the place assailed him: unwashed bodies, distillate esters of reclaimed wastes, everywhere the sour effluvia of humanity with, over it all, a turbulence of spice and spicelike harmonics.

"Why are we waiting, Farok?" Paul asked.

"For the Reverend Mother, I think. You heard the message—poor Chani."

Poor Chani? Paul asked himself. He looked around, wondering where she was, where his mother had got to in all this crush.

Farok took a deep breath. "The smells of home," he said.

Paul saw that the man was enjoying the stink of this air, that there was no irony in his tone. He heard his mother cough then, and her voice came back to him through the press of the troop: "How rich the odors of your sietch, Stilgar. I see you do much working with the spice here . . . you make paper . . . plastics . . . and isn't that chemical explosives?"

"You know this from what you smell?" It was another man's voice.

And Paul realized she was speaking for his benefit, that she wanted him to make a quick acceptance of this assault on his nostrils.

There came a buzz of activity at the head of the troop, a prolonged indrawn breath that seemed to pass through the Fremen, and Paul heard hushed voices come down the line: "It's true then—Liet is dead."

Liet, Paul thought. Then: *Chani, daughter of Liet.* The pieces fell together in his mind. Liet was the Fremen name of the Planetologist, Kynes.

Paul looked at Farok, asked: "Is it the Liet known as Kynes?"

"There is only one Liet," Farok said.

Paul turned, stared at the robed back of a Fremen in front of him. *Then Liet-Kynes is dead,* he thought.

"It was Harkonnen treachery," someone hissed. "They made it seem an accident . . . lost in the desert . . . a 'thopter crash . . ."

Paul felt a burst of anger. The man who had befriended them, helped save them from the Harkonnen hunters, the man who had sent his Fremen cohorts searching for two strays in the desert . . . another victim of the Harkonnens.

"Does Usul hunger yet for revenge?" Farok asked.

Before Paul could answer, there came a low call and the troop swept forward into a wider chamber, carrying Paul with them. He found himself in an open space confronted by Stilgar and a strange woman wearing a flowing wraparound garment of brilliant orange and green. Her arms were bare to the shoulders, and he could see she wore no stillsuit. Her skin was a pale olive. Dark hair swept back from her high forehead, throwing emphasis on sharp cheekbones and aqualine nose between the dense darkness of her eyes.

She turned toward him, and Paul saw golden rings threaded with water tallies dangling from her ears.

"*This* bested my Jamis?" she demanded.

"Be silent, Harah," Stilgar said. "It was Jamis' doing—*he* invoked the Tahaddi al-burhan."

"He's not but a boy!" she said. She gave her head a sharp shake from side to side, setting the water tallies to jingling. "My children made fatherless by another child? Surely, 'twas an accident!"

"Usul, how many years have you?" Stilgar asked.

"Fifteen standard," Paul said.

Stilgar swept his eyes over the troop. "Is there one among you cares to challenge me?"

Silence.

Stilgar looked at the woman. "Until I've learned his weirding ways, I'd not challenge him."

She returned his stare. "But—"

"You saw the stranger woman who went with Chani to the Reverend Mother?" Stilgar asked. "She's an outfreyn Sayyadina, mother to this lad. The mother and son are masters of the weirding ways of battle."

"Lisan al-Gaib," the woman whispered. Her eyes held awe as she turned them back toward Paul.

The legend again, Paul thought.

"Perhaps," Stilgar said. "It hasn't been tested, though." He returned his attention to Paul. "Usul, it's our way that you've now the responsibility for Jamis' woman here and for his two sons. His *yali* . . . his quarters, are yours. His coffee service is yours . . . and this, his woman."

Paul studied the woman, wondering: *Why isn't she mourning her man? Why does she show no hate for me?* Abruptly, he saw that the Fremen were staring at him, waiting.

Someone whispered: "There's work to do. Say how you accept her."

Stilgar said: "Do you accept Harah as woman or servant?"

Harah lifted her arms, turning slowly on one heel. "I am still young, Usul. It's said I still look as young as when I was with Geoff . . . before Jamis bested him."

Jamis killed another to win her, Paul thought.

Paul said: "If I accept her as servant, may I yet change my mind at a later time?"

"You'd have a year to change your decision," Stilgar said. "After that, she's a free woman to choose as she wishes . . . or, you could free her to choose for herself at any time. But she's your responsibility, no matter what, for one year . . . and you'll always share some responsibility for the sons of Jamis."

"I accept her as servant," Paul said.

Harah stamped a foot, shook her shoulders with anger. "But I'm young!"

Stilgar looked at Paul, said: "Caution's a worthy trait in a man who'd lead."

"But I'm young!" Harah repeated.

"Be silent," Stilgar commanded. "If a thing has merit, it'll be. Show Usul to his quarters and see he has fresh clothing and a place to rest."

"Ohhhh!" she said.

Paul had registered enough of her to have a first approximation. He felt the impatience of the troop, knew many things were being delayed here. He wondered if he dared ask the whereabouts of his mother and Chani, saw from Stilgar's nervous stance that it would be a mistake.

He faced Harah, pitched his voice with tone and tremolo to accent her fear and awe, said: "Show me my quarters, Harah! We will discuss your youth another time."

She backed away two steps, cast a frightened glance at Stilgar. "He has the weirding voice," she husked.

"Stilgar," Paul said. "Chani's father put heavy obligation on me. If there's anything—"

"It'll be decided in council," Stilgar said. "You can speak then." He nodded in dismissal, turned away with the rest of the troop following him.

Paul took Harah's arm, noting how cool her flesh seemed, feeling her tremble. "I'll not harm you, Harah," he said. "Show me our quarters." And he smoothed his voice with ralaxants.

"You'll not cast me out when the year's gone?" she said. "I know for true I'm not as young as once I was."

"As long as I live you'll have a place with me," he said. He released her arm. "Come now, where are our quarters?"

She turned, led the way down the passage, turning right into a wide cross-tunnel lighted by evenly spaced yellow overhead globes. The stone floor was smooth, swept clean of sand.

Paul moved up beside her, studied the aqualine profile as they walked. "You do not hate me, Harah?"

"Why should I hate you?"

She nodded to a cluster of children who stared at them from the raised ledge of a side passage. Paul glimpsed adult shapes behind the children partly hidden by filmy hangings.

"I . . . bested Jamis."

"Stilgar said the ceremony was held and you're a friend of Jamis." She glanced sidelong at him. "Stilgar said you gave moisture to the dead. Is that truth?"

"Yes."

"It's more than I'll do . . . can do."

"Don't you mourn him?"

"In the time of mourning, I'll mourn him."

They passed an arched opening. Paul looked through it at men and women working with stand-mounted machinery in a large, bright chamber. There seemed an extra tempo of urgency to them.

"What're they doing in there?" Paul asked.

She glanced back as they passed beyond the arch, said: "They hurry to finish the quota in the plastics shop before we flee. We need many dew collectors for the planting."

"Flee?"

"Until the butchers stop hunting us or are driven from our land?"

Paul caught himself in a stumble, sensing an arrested instant of Time, remembering a fragment, a visual projection of prescience—but it was displaced, like a montage-in-motion. The bits of his prescient memory were not quite as he remembered them

"The Sardaukar hunt us," he said.

"They'll not find much excepting an empty sietch or two," she said. "And they'll find their share of death in the sand."

"They'll find this place?" he asked.

"Likely."

"Yet we take the time"— he motioned with his head toward the arch now far behind them—"to make . . . dew collectors?"

"The planting goes on."

"What're dew collectors?" he asked.

The glance she turned on him was full of surprise. "Don't they teach you anything in the . . . wherever it is you come from?"

"Not about dew collectors."

"Hai!" she said, and there was a whole conversation in the one word.

"Well, what are dew collectors?" Paul demanded.

"Each bush, each weed you see out there in the erg," she said, "how do you suppose it lives when we leave it? Each is planted most tenderly in its own little pit. The pits are filled with smooth ovals of chromoplastic. Light turns them white. You can see them glistening in the dawn if you look down from a high place. White reflects. But when Old Father Sun departs, the chromoplastic reverts to transparency in the dark. It cools with extreme rapidity. The surface condenses moisture out of the air. That moisture trickles down to keep our plants alive."

"Dew collectors," he muttered, enchanted by the simple beauty of such a scheme.

"I'll mourn Jamis in the proper time for it," she said, as though her mind had not left his other question. "He was a good man, Jamis, but quick to anger. A good provider, Jamis, and a wonder with the children. He made no separation between Geoff's boy, my first-born, and his own true son. They were equal in his eyes." She turned a questing stare on Paul. "Would it be that way with you, Usul?"

"We don't have that problem."

"But if—"

"Harah!"

She recoiled at the harsh edge in his voice.

They passed another brightly lighted room visible through an arch on their left. "What's made there?" he asked.

"They repair the weaving machinery," she said. "But it must be dismantled by tonight." She gestured at a tunnel branching to their left. "Through there and beyond, that's food processing and stillsuit maintenance." She looked at Paul. "Your suit looks new. But if it needs work, I'm good with suits. I work in the factory in season."

They began coming on knots of people now and thicker clusterings of openings in the tunnel's sides. A file of men and women passed them carrying packs that gurgled heavily, the smell of spice strong about them.

"They'll not get our water," Harah said. "Or our spice. You can be sure of that."

Paul glanced at the openings in the tunnel walls, seeing the heavy carpets on the raised ledges, glimpses of rooms with bright fabrics on the walls, piled cushions. People in the openings fell silent at their approach, followed Paul with untamed stares.

"The people find it strange you bested Jamis," Harah said. "Likely you'll have some proving to do when we're settled in a new sietch.

"I don't like killing," he said.

"Thus Stilgar tells it," she said, but her voice betrayed her disbelief.

A shrill chanting began to grow louder ahead of them. They came to another side opening wider than any of the others Paul had seen. He slowed his pace, staring in at a room crowded with children sitting cross-legged on a maroon-carpeted floor.

At a chalkboard against the far wall stood a woman in a yellow wraparound, a projecto-stylus in one hand. The board was filled with designs—circles, wedges and curves, snake tracks and squares, flowing arcs split by parallel lines. The woman pointed to the designs one after the other as fast as she could move the stylus, and the children chanted in rhythm with her moving hand.

Paul listened, hearing the voices grow dimmer behind as he moved deeper into the sietch with Harah.

"Trees," the children chanted. "Trees, grass, dune, wind, mountain, hill, fire, lightning, rock, rocks, dust, sand, heat, shelter, heat, full, winter, cold, empty, erosion, summer, caravan, day, tension, moon, night, sandtide, slope, planting, binder—"

"You conduct classes at a time like this?" Paul asked.

Her face went somber and grief edged her voice: "What Liet taught us, we cannot pause an instant in that. Liet who is dead must not be forgotten. It's the Chakobsa Way."

She crossed the tunnel to the left, stepped up onto a ledge, parted gauzy orange hangings and stood aside: "Your yali is ready for you, Usul."

Paul hesitated before joining her on the ledge. He felt a sudden reluctance to be alone with this woman. It came to him that he was surrounded by a way of life that could only be understood by postulating an ecology of ideas and values. He felt that this Fremen world was fishing for him, trying to snare him in its ways. And he knew what lay in that snare—the wild *jihad*, the religious war he felt he should avoid at any cost.

"This is your yali," Harah said. "Why do you hesitate?"

Paul nodded, joined her on the ledge. He lifted the hangings across from her, feeling metal fibers in the fabric, followed her into a short entranceway and then into a larger room, square, about six meters to a side—thick blue carpets on the floor, blue and green fabrics hiding the rock walls, glowglobes tuned to yellow overhead bobbing against draped yellow ceiling fabrics.

The effect was an ancient tent.

Harah stood in front of him, left hand on hip, her eyes studying his face. "The children are with a friend," she said. "They will present themselves later."

Paul masked his unease beneath a quick scanning of the room. Thin hangings to the right, he saw, partly concealed a larger room with cushions piled around the walls. He felt a soft breeze from an air duct, saw the outlet cunningly hidden in a pattern of hangings directly ahead of him.

"Do you wish me to help you remove your stillsuit?" Harah asked.

"No . . . thank you."

"Shall I bring food?"

"Yes."

"There is a reclamation chamber off the other room." She gestured. "For your comfort and convenience when you're out of your stillsuit."

"You said we have to leave this sietch," Paul said. "Shouldn't we be packing or something?"

"It will be done in its time," she said. "The butchers have yet to penetrate to our region."

Still she hesitated, staring at him.

"What is it?" he demanded.

"You've not the eyes of the Ibad," she said. "It's strange but not entirely unattractive."

"Get the food," he said. "I'm hungry."

She smiled at him—a knowing, woman's smile that he found disquieting. "I am your servant," she said, and whirled away in one lithe motion, ducking behind a heavy wall hanging that revealed another narrow passage before falling back into place.

Feeling angry with himself, Paul brushed through the thin hanging on the right and into the larger room. He stood there a moment caught by uncertainty. And he wondered where Chani was—Chani who had just lost her father.

A wailing cry sounded from the outer corridors, its volume muffled by the intervening hangings. It was repeated, and again, a bit more distant. Again. Paul realized someone was calling the time. He focused on the fact that he had seen no clocks.

The faint smell of burning creosote bush came to his nostrils, riding on the omnipresent sietch stink.

Again, he thought about his mother and the daughter she would bear—how the moving montage of the future would incorporate them. Mutable Time-awareness danced in his consciousness . . . and he saw that his mother had not enough ruthlessness to be truly kind. But the daughter would be another matter.

Paul shook his head, focused his attention on the present and the assault of newness upon his senses, aware that as each now-experience linked with prescient anticipation, the patterns of more possible lives were fixed and locked within him.

The incorporation of possibilities passed a subtle threshold, and he saw a thing about cavern life that suggested far greater differences between the Fremen way and the Imperium way.

There was no sign of poison snoopers or their use anywhere in the cave warren. Yet he could smell poisons in the sietch—strong poisons and common ones.

Hangings rustled at his left and he thought it was Harah returning with food, turned to watch. From beneath a displaced pattern in the wall fabrics two boys emerged. They were aged about nine and ten. They stared at him with greedy eyes. Each wore a small kindjal-type crysknife and rested a hand on the hilt.

And Paul recalled stories about the Fremen—that their children fought as ferociously as the adults. These, he knew, were Harah's children . . . and they might bear him hatred.

XV

The hands move, the lips move—
Ideas gush from his words,
And his eyes devour!
He is an island of Selfdom.

"A Manual of Muad'Dib"
by The Princess Irulan

Phosphortubes in the far away upper reaches of the cavern cast a dim light onto the thronged interior, hinting at the great size of this rock-enclosed space—larger, Jessica saw, than even the Gathering Hall of her Bene Gesserit School. She estimated there were more than five thousand people gathered out there beneath the ledge where she stood with Stilgar.

And more were coming.

The air was murmurous with people.

"Your son has been summoned from his rest, Sayyadina," Stilgar said. "Do you wish him to share in your decision?"

"Could he change my decision?"

"Certainly, the air with which you speak comes from your own lungs, but—"

"The decision stands," she said.

But she felt misgivings, wondering if she should use Paul as an excuse for backing out of a dangerous course. There was an unborn daughter to think of, as well. What endangered the flesh of the mother endangered the flesh of the daughter.

Men came with rolled carpets, grunting under the weight of them, stirring up dust as the loads were dropped onto the ledge.

Stilgar took her arm, led her back into the accoustical horn that formed the rear limits of the ledge. He indicated a rock bench within the horn. "The Reverend Mother will sit here, but you may rest yourself until she comes."

"I prefer to stand," Jessica said.

She watched the men unroll the carpets, covering the ledge, looked out at the crowd. There were at least ten thousand people on the rock floor now.

And still they came.

Out on the desert, she knew, it already was red nightfall, but here in the cavern hall was perpetual twilight, a gray vastness thronged with people come to see her risk her life.

A way was opened through the crowd to her right, and she saw Paul approaching flanked by two children. There was a swaggering air of self-importance about the children. They kept hands on knives, scowled at the wall of people on either side.

"The sons of Jamis who are now the sons of Usul," Stilgar said. "They take their escort duties seriously." He ventured a smile at Jessica.

Jessica recognized the effort to lighten her mood and was grateful for it, but could not take her mind from the mystery and danger that confronted her.

I had no choice but to do this, she thought. *We must move swiftly if we're to secure our place among these Fremen.*

Paul climbed to the ledge, leaving the children below. He stopped in front of his mother, glanced at Stilgar, back to Jessica. "What is happening? I thought I was being summoned to council."

Stilgar raised a hand for silence, gestured to his left where another way had been opened in the throng. Chani came down the lane opened there, her elfin face set in lines of grief. She had removed her stillsuit and wore a graceful blue wraparound that exposed her thin arms. Near the shoulder on her left arm, a green kerchief had been tied.

Green for mourning, Paul thought.

It was one of the customs the two sons of Jamis had explained by indirection, telling Paul they wore no green because they accepted him as guardian-father.

"Are you the Lisan al-Gaib?" they'd asked. And Paul, sensing the jihad in their words, shrugged off their probing with questions of his own, learning that they were Kaleff, aged ten, the natural son of Geoff, and Orlop, aged eight, the natural son of Jamis.

It had been a warlock day with those two standing guard because he asked it, fending the curious and allowing him time to nurse his thoughts and his prescient maturing.

Now, standing beside his mother and looking out at the thronging cavern, he wondered if he could ever accept the unfolding futures—if one of those futures transformed these people into a wild outpouring of fanatic legions.

Chani neared the ledge, followed by four women carrying another woman in a litter.

Jessica focused all her attention on the woman in the litter—a crone, a wrinkled and shriveled ancient in black gown with hood thrown back to reveal tightly knotted gray hair and a stringy neck. She was deposited on the ledge. Chani helped the old woman to her feet.

So this is their Reverend Mother, Jessica thought.

The old woman leaned heavily on Chani, hobbled toward Jessica. The crone looked like a collection of sticks draped in a black robe. She stopped a pace away, peered upward for a long moment before speaking in a husky whisper.

"So you're the one." The old head nodded once precariously on the thin neck. "Shadout Mapes was right to pity you."

Jessica spoke quickly, scornfully: "I need no pity."

"Remains to be seen," husked the old woman. She turned with surprising quickness, faced the throng. "Tell them, Stilgar."

"Must I?" he asked.

"We are the people of Misr," the old woman rasped. "Since our Sunni ancestors fled from Nilotic al-Ourouba, we have known flight and death. The young go on that our people shall not die."

Stilgar took a deep breath, stepped forward two paces.

Jessica felt the hush come over the crowded cavern—some twenty thousand people now, standing silently, almost without movement. It made her feel suddenly small and filled with caution.

"Tonight, we must leave this sietch that has sheltered us for so long and go south into the desert," Stilgar said. His voice boomed out across the uplifted faces, reverberating with the force given it by the accoustical horn behind the ledge.

Still, the throng remained silent.

"The Reverend Mother tells me she cannot survive another hajra," Stilgar said. "We have lived before without a Reverend Mother, but it is not good for people to seek a new home in such straits."

Now, the throng stirred, rippling with whispers and currents of disquiet.

"That this may not come to pass," Stilgar said, "our new Sayyadina, Jessica of the Weirding, has consented to enter the rite at this time. She will attempt to pass within that we not lose the strength of Our Reverend Mother."

Jessica of the Weirding, Jessica thought. She saw Paul staring at her, his eyes filled with questions, but his mouth held silent by all the strangeness around them.

If I die in the attempt, what will become of him? Jessica asked herself. Again, she felt the misgivings fill her mind.

Chani led the old Reverend Mother to a rock bench deep in the accoustical horn, returned to stand beside Stilgar.

"That we may not lose all if Jessica of the Weirding should fail," Stilgar said, "Chani, daughter of Liet, will be consecrated in the Sayyadina at this time." He stepped one pace to the side.

From deep in the acoustical horn, the old woman's voice came out to them, an amplified whisper, harsh and penetrating: "Chani has returned from her hajra—Chani has seen the waters."

A susurrant response arose from the crowd: "She has seen the waters."

"I consecrate the daughter of Liet in the Sayyadina," husked the old woman.

"She is accepted," the crowd responded.

Paul barely heard the ceremony, his attention still centered on what had been said of his mother.

If she should fail?

He turned and looked back at the one they called Reverend Mother, studying the dried crone features, the fathomless blue fixation of her eyes. She looked as though a breeze would blow her away, yet there was that about her which suggested she might stand untouched in the path of a Coriolis storm. She carried the same aura of power that he remembered from the Reverend Mother Gaius Helen Mohiam who had tested him with agony in the way of the *gom jabbar.*

She looked formidable.

"I, the Reverend Mother Ramallo, whose voice speaks as a multitude, say this to you," the old woman said. "It is fitting that Chani enter the Sayyadina."

"It is fitting," the crowd responded.

The old woman nodded, whispered: "I give her the silver skies, the golden desert and its shining rocks, the green fields that will be. I give these to Sayyadina Chani. And lest she forget that she's servant of us all, to her fall the menial tasks in this Ceremony of the Seed. Let it be as Shai-hulud will have it." She lifted a brown-stick arm, dropped it.

Jessica, feeling the ceremony close around her with a current that swept her beyond all turning back, glanced once at Paul's question-filled face, then prepared herself for the ordeal. The terror of this moment, she knew, lay in the fact that she could sense deadliness approaching but did not know its form.

"Let the watermasters come forward," Chani said with only the slightest quaver of uncertainty in her girlchild voice.

Now, Jessica felt herself at the focus of danger, knowing its presence in the watchfulness of the throng, in the silence.

A small band of men approached through a serpentine way opened in the crowd, moving up from the back in pairs. Each pair carried a small skin sack, perhaps twice the size of a human head. The sacks sloshed heavily.

The two leaders deposited their load at Chani's feet on the ledge and stepped back.

Jessica looked at the sack, then at the men, seeking a clue. The men had their hoods thrown back exposing long hair tied in a roll at the base of the neck. The black pits of their eyes stared back at her without wavering.

A furry redolence of cinnamon arose from the sack, wafted across Jessica. *The spice?* she wondered.

"Is there water?" Chani asked.

The watermaster on the left, a man with a purple scar-line across the bridge of his nose, nodded once. "There is water, Sayyadina," he said, "but we cannot drink of it."

"Is there seed?" Chani asked.

"There is seed," the man said.

Chani knelt and put her hands to the sloshing sack. "Blessed is the water and its seed."

Jessica looked back at the Reverend Mother Ramallo seeking a clue there to the unfamiliar rite. The old woman sat hunched over, eyes closed as though asleep.

"Sayyadina Jessica," Chani said.

Jessica turned to see the girl staring up at her.

"Have you tasted the Blessed Water?" Chani asked.

Before Jessica could frame an answer, Chani said: "It is not possible you have tasted the Blessed Water. You are outworlder and unprivileged."

A sigh passed through the crowd, a susurration of robes that made Jessica's nape hairs creep.

"The Maker has been destroyed and the crop was large," Chani said. She uncoiled a spout fixed to the top of the sack.

Jessica felt danger boiling around her. She glanced at Paul, saw how he had been caught up in the ritual's mystery. *Has he seen this moment in Time?* Jessica wondered. She rested a hand on her abdomen, thinking of her unborn daughter, asking herself: *Do I have the right to risk us both?*

Paul, rejecting all knowledge of possible outcomes, had fallen into an acceptance of the moment and whatever it brought. *Kindness involves letting Life happen,* he thought. *Death is part of life.*

Chani offered the spout to Jessica, said: "Here is the water of life—*Kan,* the water that frees the soul. Let Shaihulud judge if you be Reverend Mother."

Jessica felt herself torn between duty to her unborn daughter and duty to Paul. For Paul, she knew she should take that spout and drink, but as she bent to it, her senses revealed the source of peril.

The stuff in the sack had a bitter smell subtly akin to many poisons she knew.

"You must drink it," Chani said.

There's no turning back, Jessica reminded herself. But nothing in all her Bene Gesserit training came into her mind to help her through this instant.

What is it? Jessica asked herself. *Liquor? A Drug?*

She bent over the spout, smelled the esters of cinnamon, remembering then the drunkenness of Duncan Idaho. *Spice liquor?* she asked herself. She took the siphon tube in her mouth, pulled up only the most minuscule sip. It tasted of the spice, a faint bite acrid on the tongue.

Chani pressed down on the skin bag. A great gulp of the stuff surged into Jessica's mouth and before she could help herself, she swallowed it.

"To accept a little death is worse than death itself," Chani said. She stared at Jessica, waiting.

And Jessica stared back, still holding the spout in her mouth. She tasted the sack's contents in her nostrils, in the roof of her mouth, in her cheeks, in her eyes—a biting sweetness, now.

Cool.

Again, Chani sent the liquid gushing into Jessica's mouth.

Delicate.

Jessica studied Chani's face—elfin features—seeing the traces of Liet-Kynes there as yet unfixed by time.

This is a drug they feed me, Jessica told herself.

But it was unlike any other drug of her experience, and Bene Gesserit training included the taste of many drugs.

Chani's features were so clear, as though outlined in light.

A drug.

Whirling silence settled around Jessica. Every fiber of her body accepted the fact that something profound had happened to it. She felt that she was a conscious mote, smaller than any subatomic particle, yet capable of motion and of sensing her surroundings. In an abrupt revelation, the curtains whipped away. She realized she had become aware of a psycho-kinesthetic extension of herself. She was mote and not-mote.

Yet, the cavern remained—and its people. She sensed them: Paul, Chani, Stilgar, the Reverend Mother . . . the throng.

Reverend Mother!

There'd been rumors at the school that some did not survive the ordeal into Reverend Motherhood.

Jessica focused attention on the Reverend Mother Ramallo, aware now that all this was happening in a frozen instant of suspended Time.

She stared at frozen expressions all around, saw a dust mote suspended above Chani. *Why is Time suspended?*

The answer came like an explosion in her consciousness: Time was not suspended, but her awareness had been accelerated to a terrible speed . . . and she knew why.

To save my life!

She focused on the psycho-kinesthetic extension of herself, looked within, and was confronted by a cellular core, a pit of blackness from which she recoiled.

That is the place where we cannot look, she thought. *There is the place Reverend Mothers mention reluctantly —where only the Kwisatz Haderach may look.*

The realization brought a small return of confidence. Again, she ventured to focus on her psycho-kinesthetic extension, becoming a mote-self that searched within for danger.

She found it within the swallowed drug.

The stuff was dancing particles to her mote-self, motion so rapid that even frozen Time could not stop it. Dancing particles . . . and she recognized familiar structures, atomic linkages: a carbon atom here, helical wavering . . . a glucose molecule. An entire chain of molecules confronted her, and she recognized a protein . . . a methyl-protein configuration.

Ahhh!

It was a soundless mental sigh within her as she saw the nature of the poison.

With her psycho-kinesthetic probing, she moved into it, shifted an oxygen mote, allowed another carbon mote to link, re-attached a linkage of oxygen . . . hydrogen.

The change spread . . . faster and faster as the catalyzed reaction spread its surface of contact.

The suspension of Time relaxed its hold upon her, and she sensed motion. The tube spout from the sack was touched to her mouth—gently, collecting a drop of moisture.

Chani's taking the catalyst from my body to change the poison in that sack, Jessica thought. *Why?*

Someone eased her to a sitting position. She saw the old Reverend Mother Ramallo being brought to sit beside her on the carpeted ledge. A dry hand touched her neck.

And there was another psycho-kinesthetic mote within her awareness! Jessica tried to reject it, but the mote swept closer . . . closer.

They touched!

It was like an ultimate *simpatico,* being two people at once: not telepathy, but mutual awareness.

With the old Reverend Mother!

But Jessica saw that the Reverend Mother didn't think of herself as old. An image unfolded before the mutual mind's eye: a young girl with a dancing spirit and tender humor.

Within the mutual awareness, the young girl said: "Yes, that is how I am."

Jessica could only accept the words, not respond to them.

"You'll have it all soon, Jessica," the inward image said.

This is hallucination, Jessica told herself.

"You know better than that," the inward image said. "Swiftly now, do not fight me. There isn't much time. We . . ." There came a long pause, then: "You should've told us you were pregnant!"

Jessica found the voice that talked within the mutual awareness: "Why?"

"This changes both of you! Holy Mother, what have we done?"

Jessica sensed a forced shift in the mutual awareness, saw another mote-presence with the inward eye. The other mote darted wildly here, there, circling. It radiated pure terror.

"You'll have to be strong," the old Reverend Mother's image-presence said. "Be thankful it's a daughter you carry. This would've killed a male fetus. Now . . . carefully, gently . . . touch your daughter-presence. Be your daughter-presence. Absorb the fear . . . soothe . . . use your courage and your strength . . . gently now . . . gently . . ."

The other whirling mote swept near, and Jessica compelled herself to touch it.

Terror threatened to overwhelm her.

She fought it the only way she knew: *"I shall not fear. Fear is the mind killer . . ."*

The litany brought a semblance of calm. The other mote lay quiescent against her.

Words won't work, Jessica told herself.

She reduced herself to basic emotional reactions, radiated love, comfort, a warm snuggling of protection.

The terror receded.

Again, the presence of the old Reverend Mother asserted itself, but now there was a tripling of mutual awareness—two active and one that lay quietly absorbing.

"Time compels me," the Reverend Mother said within the awareness. "I have much to give you. And I do not know if your daughter can accept all this while remaining sane. But it must be: the needs of the Tribe are paramount."

"What . . ."

"Remain silent and accept!"

Experiences began to unroll before Jessica. It was like a lecture strip in a subliminal training projector at the Bene Gesserit School . . . but faster . . . blindingly faster.

Yet . . . distinct.

She knew each experience as it happened: there was a lover—virile, bearded, with the dark Fremen eyes, and Jessica saw his strength and tenderness, all of him in one blink-moment, through the Reverend Mother's memory.

There was no time now to think of what this might be doing to the daughter-fetus, only time to accept and record. The experiences poured in on Jessica—birth, life, death—important matters and unimportant, an outpouring of single-view Time.

Why should a fall of sand from a clifftop stick in the memory? she asked herself.

Too late, Jessica saw what was happening: the old woman was dying and, in dying, pouring her experiences into Jessica's awareness as water is poured into a cup. The other mote faded back into pre-birth awareness as Jessica watched it. And, dying-in-conception, the old Reverend Mother left her life in Jessica's memory with one last sighing blur of words.

"I've been a long time waiting for you," she said. "Here is my life."

There it was, encapsuled, all of it.

Even the moment of death.

I am now a Reverend Mother, Jessica realized.

And she knew with a generalized awareness that she had become, in truth, precisely what was meant by a Bene Gesserit Reverend Mother. The poison drug had transformed her.

Jessica sensed the daughter-mote still touching her inner-awareness, probed it without response.

A terrible sense of loneliness crept through Jessica in the realization of what had happened to her. She saw her own life as a pattern that had slowed and all life around her speeded up so that the dancing interplay became clearer.

The sensation of mote-awareness faded slightly, its intensity easing as her body relaxed from the threat of the poison, but still she felt that *other* mote, touching it with a sense of guilt at what she had allowed to happen.

I did it, my poor unformed dear little daughter. I brought you into this universe and exposed your awareness to all its varieties without any defenses.

A tiny outflowing of love-comfort, like a reflection of what she had poured into it, came from the other mote.

Before Jessica could respond, she felt the *adab* presence of demanding memory. There was something that needed doing. She groped for it, realizing she was being impeded by a muzziness of the changed-drug permeating her senses.

I could change that, she thought. *I could take away the drug action and make it harmless.* But she sensed this would be an error. *I'm within a rite of joining.*

Then she knew what she had to do.

Jessica opened her eyes, gestured to the watersack now being held above her by Chani.

"It has been blessed," Jessica said. "Mingle the waters, let the change come to all, that the people may partake and share in the blessing."

Let the catalyst do its work, she thought. *Let the people drink of it and have their awareness of each other heightened for a while. The drug is safe now . . . now that a Reverend Mother has changed it.*

Still, the demanding memory worked on her, thrusting. There was another thing she had to do, she realized, but the drug made it difficult to focus.

Ahhhhh . . . the old Reverend Mother.

"I have met the Reverend Mother Ramallo," Jessica said. "She is gone, but she remains. Let her memory be honored in the rite."

Now, where did I get those words? Jessica wondered.

And she realized they came from another memory, the *life* that had been given to her and now was part of herself. Something about that gift felt incomplete, though.

"*Let them have their orgy,*" the other-memory said within her. "They've little enough pleasure out of living. Yes, and you and I need this little time to become acquainted before I recede and pour out through your memories. Already, I feel myself being tied to bits of you. Ahhh, you've a mind filled with interesting things. So many things I'd never imagined."

And the memory-mind encapsulated within her opened itself to Jessica, permitting a view down a wide corridor to other Reverend Mothers within other Reverend Mothers within other Reverend Mothers until there seemed no end to them.

Jessica recoiled, fearing she would become lost in an ocean of oneness. Still, the corridor remained, revealing to Jessica that the Fremen culture was far older than she had suspected.

There had been Fremen on Poritrin, she saw, a people grown soft with an easy planet, fair game for Imperial raiders to harvest and plant human colonies on Bela Tegeuse and Salusa Secundus.

Oh, the wailing Jessica sensed in *that* parting.

Far down the corridor, an image-voice screamed: "They denied us the Hajj!"

Jessica saw the slave cribs on Bela Tegeuse down that inner corridor, saw the weeding out and the selecting that spread men to Rossak and Harmonthep. Scenes of brutal ferocity opened to her like the petals of a terrible flower. And she saw the thread of the past carried by Sayyadina after Sayyadina—first by word of mouth, hidden in the sand chanteys, then refined through their own Reverend Mothers with the discovery of a poison drug on Rossak . . . and now developed to subtle strength on Arrakis in the discovery of the *Water of Life.*

Far down the inner corridor, another voice screamed: "Never to forgive! Never to forget!"

But Jessica's attention was focused on the revelation of the Water of Life, seeing its sources: the liquid exhalation of a dying sandworm, a Maker. And as she saw the killing of it in her new memory, she suppressed a gasp.

The creature was drowned!

"Mother, are you all right?"

Paul's voice intruded on her, and Jessica struggled out of the inner awareness to stare up at him, conscious of duty to him, but resenting his presence.

I'm like a person whose hands were kept numb, without sensation from the first moment of awareness—until one day the ability to feel is forced into them.

The thought hung in her mind, an enclosing awareness.

And I say: "Look! I have hands!" But the people all around me say: "What are hands?"

"Are you all right?" Paul repeated.

"Yes."

"Shall I drink this?" He gestured to the sack in Chani's hands.

Jessica realized he knew what the sack held, that he had detected the poison in the original and . . . Then she saw that he *really* knew what the sack held, and she recalled the drug's effect on him . . . that it plunged him into prescient awareness. For the first time, she saw his unconscious battle *against* his talent.

But there was the rite to observe here.

"You must drink it," she said.

Jessica looked beyond Paul to see Stilgar's dark-dark eyes studying her.

"Now, we know you cannot be false," he said.

She sensed another meaning, but the drug's muzziness was overpowering her. How warm it was, how soothing. How kind the Fremen to enfold her in such companionship.

Paul saw the drug take hold of his mother.

He searched within himself along the fixed past and the flux-lines of possible futures, scanned through arrested instants disconcerting to the lens of the inner eye. These "nows" were difficult fragments to assimilate, snatched as they were out of the flux, lacking the simultaneous fluid succession and ceaseless modification of reality.

The drug he understood, but his knowledge lacked a natural rhythm, lacked a systematic digestion. And he realized that it was one thing to see the past occupying the present, but a more terrifying test was to see the past in the future.

Things persisted in not being . . . true to the senses.

"Drink it," Chani commanded. She waved the hornspout of a watersack under his nose.

Paul straightened, staring at Chani. He felt carnival excitement in the air. He knew what would happen if he drank this spice drug with its quintessence of the substance that brought the change onto him. He would return to the vision of pure Time, of Time-become-space. It would perch him on the dizzying summit and defy him to understand.

From behind Chani, Stilgar said: "Drink it, lad. You delay the rite."

Paul listened to the crowd then, hearing the wildness in their voices—"Lisan al-Gaib," they said. "Muad'Dib!" He looked down at his mother. She appeared peacefully asleep in a sitting position—her breathing even and deep. A phrase out of the future that was his lonely past came into his mind: *"She sleeps in the Waters of Life."*

Chani tugged at his sleeve.

Paul took the hornspout into his mouth, hearing the people shout. He felt the liquid gush into his throat as Chani pressed the sack, sensed giddiness in the fumes. Chani removed the spout, passed the sack into hands that reached for it from the floor of the cavern. His eyes focused on her arm, the green band of mourning there.

As she straightened, Chani saw the direction of his gaze, said: "I can mourn him even in the happiness of the waters. This was something he gave us." She put her hand into his, pulling him along the ledge. "We are alike in a thing, Usul: We have each lost a father to the Harkonnens."

Paul followed her. He felt that his head had been separated from his body and restored with odd connections. His legs were remote and rubbery.

They entered a narrow side passage, its walls dimly lighted by spaced out glowglobes. Paul felt the drug beginning to have its unique effect with him, opening Time like a flower. He found need to steady himself against Chani as they turned through another shadowed tunnel. The mixture of whipcord and softness he felt beneath her robe stirred his blood. The sensation mingled with the work of the drug, folding future and past into the present, leaving him the thinnest margin of trinocular focus.

"I know you, Chani," he whispered. "We've sat upon a ledge above the sand while I soothed your fears. We've caressed in the dark of the sietch. We've . . ." He found himself losing focus, tried to shake his head, stumbled.

Chani steadied him, led him through thick hangings into the yellow warmth of a private apartment—low tables, cushions, a sleeping pad beneath an orange spread.

Paul grew aware that they had stopped, that Chani stood facing him, and that her eyes betrayed a look of quiet terror.

"You must tell me," she whispered.

"You are Sihaya," he said, "the desert spring."

"When the tribe shares the Water," she said, "we're together—all of us. We . . . share. I can . . . sense the others with me, but I'm afraid to share with you."

"Why?"

He tried to focus on her, but past and future were merging into the present, blurring her image. He saw her in countless ways and positions and settings.

"There's something frightening in you," she said. "When I took you away from the others . . . I did it because I could feel what the others wanted. You . . . press on people. You . . . make us *see* things!"

He forced himself to speak distinctly: "What do you see?"

She looked down at her hands. "I see a child . . . in my arms. It's our child, yours and mine." She put a hand to her mouth. "How can I know every feature of you?"

They've a little of the talent, his mind told him. *But they suppress it because it terrifies.*

In a moment of clarity, he saw Chani was trembling. "What is it you want to say?" he asked.

"Usul," she whispered, and still she trembled.

"You cannot back into the future," he said.

A profound compassion for her swept through him. He pulled her against him, stroked her head. "Chani, Chani, don't fear."

"Usul, help me," she cried.

As he spoke, he felt the drug complete its work within him, ripping away the curtains to let him see the distant gray turmoil of his future.

"You're so quiet," Chani said.

He held himself poised in the awareness, seeing Time stretch out in its weird dimension, delicately balanced yet whirling, narrow yet spread like a net gathering countless worlds and forces, a tightwire that he must walk, yet a teeter-totter on which he balanced.

On one side he could see the Imperium, a Harkonnen called Feyd-Rautha who flashed toward him like a deadly blade, the Sardaukar raging off their planet to spread pogrom on Arrakis, the Guild conniving and plotting, the Bene Gesserits with their scheme of selective breeding. They lay massed like a thunderhead on his horizon, held back by no more than the Fremen and the Muad'Dib, the sleeping giant Fremen poised for their wild crusade across the universe.

Paul felt himself at the center, at the pivot where the whole structure turned, walking a thin wire of peace with a measure of happiness, Chani at his side. He could see it stretching ahead of him, a time of relative quiet in a hidden sietch, a moment of peace between periods of violence.

"There's no other place for peace," he said.

"Usul, you're crying," Chani murmured. "Usul, my strength, do you give moisture to the dead? To whose dead?"

"To ones not yet dead," he said.

"Then let them have their time of life," she said tenderly.

He sensed through the drug fog how right she was, pulled her against him with savage pressure. "Sihaya!" he said.

She put a palm against his cheek. "I'm no longer afraid, Usul. Look at me. I see what you see when you hold me thus."

"What do you see?" he demanded.

"I see us giving love to each other in a time of quiet between storms. It's what we were meant to do."

The drug had him again and he thought: *So many times you've given me comfort and forgetfulness.* He felt anew the hyper-illumination with its high-relief imagery of Time, sensed his future becoming memories—the tender indignities of physical love, the sharing and communion of selves, the softness and the violence.

"You're strong, Chani," he muttered. "Stay with me."

"Always," she said, and kissed his cheek.

Here follows an excerpt from the Summa prepared by her own agents at the request of the Lady Jessica immediately after the Arrakis Affair. The candor of this report amplifies its value far beyond the ordinary.

Because the Bene Gesserits operated for centuries behind the blind of a semimystic school while carrying on their selective breeding program among humans, we tend to award them with more status than they appear to deserve. Analysis of their "trial of fact" on the Arrakis Affair betrays the school's profound ignorance of its own role.

It may be argued that the Bene Gesserits could examine only such facts as were available to them and had no direct access to the person of the Prophet Muad'Dib. But the school had surmounted greater obstacles and its error here goes deeper.

The Bene Gesserit program had as its target the breeding of a person they labeled as "Kwisatz Haderach," a term signifying "one who can be many places at once." In simpler terms, what they sought was a human with mental powers permitting him to understand and use higher order dimensions.

They were breeding for a super-Mentat, a human computer with some of the prescient abilities found in Guild navigators. Now, attend these facts carefully:

Muad'Dib, born Paul Atreides, was the son of the Duke Leto, a man whose bloodline had been watched carefully for more than a thousand years. The Prophet's mother, Lady Jessica, is a natural daughter of the Baron Vladimir Harkonnen and carries gene-markers whose supreme importance to the breeding program was known for almost two thousand years. She was a Bene Gesserit bred and trained, and *should have been a willing tool of the project.*

The Lady Jessica was ordered to produce an Atreides daughter. The plan was to inbreed this daughter with Feyd-Rautha Harkonnen, a nephew of the Baron Vladimir, with the high probability of a Kwisatz Haderach from that union. Instead, for reasons she confesses have never been completely clear to her, the concubine Lady Jessica defied her orders and bore a son.

This alone should have alerted the Bene Gesserits to the possibility that a wild variable had entered their scheme. But there were other far more important indications which they virtually ignored:

1) As a youth, Paul Atreides showed ability to predict the future. He was known to have had prescient visions that were accurate, penetrating and defied four-dimensional explanation.

2) The Reverend Mother Gaius Helen Mohiam, Bene Gesserit Proctor who tested Paul's humanity when he was fifteen, deposes that he surmounted more agony in the test than any other human of record. Yet she failed to make special note of this in her report!

3) When Family Atreides moved to the planet Arrakis, the Fremen population there hailed the young Paul as a prophet, "the voice from the outer world." The Bene Gesserits were well aware that the rigors of such a planet as Arrakis with its totality of desert landscape, its absolute lack of open water, its emphasis on the most primitive necessities for survival, inevitably produces a high proportion of *sensitives*. Yet, this Fremen reaction and the obvious element of the Arrakeen diet high in spice, were glossed over by Bene Gesserit observers.

4) When the Harkonnens and the soldier-fanatics of the Padishah Emperor re-occupied Arrakis, killing Paul's father and most of the Atreides troops, Paul and his mother disappeared. But almost immediately there were reports of a new religious leader among the Fremen, a man called Muad'Dib, who again was hailed as "the voice from the outer world." The reports stated clearly that he was accompanied by a new Reverend Mother of the Sayyadina Rite "who is the woman who bore him." Records available to the Bene Gesserits stated in plain terms that the Fremen legends of the Prophet contained these words: "He shall be born of a Bene Gesserit witch."

(It may be argued here that the Bene Gesserits sent their Missionaria Protectiva onto Arrakis centuries earlier to implant something like this legend as safeguard should any members of the school be trapped there and require sanctuary, and that this legend of "the voice from the outer world" was properly to be ignored because it appeared to be the standard Bene Gesserit ruse. But this would be true only if you granted that the Bene Gesserits were correct in ignoring the other clues about Paul-Muad'Dib.)

5) When the Arrakis Affair boiled up, the Spacing Guild made overtures to the Bene Gesserits. The Guild hinted that its navigators, who use the spice drug of Arrakis to produce the limited prescience necessary for guiding spaceships through the void, were "bothered about the future" or saw "problems on the horizon." This could only mean they saw a nexus, a meeting place of countless delicate decisions, beyond which the path was hidden from the prescient eye. This was a clear indication that some agency was interfering with higher order dimensions!

(Bene Gesserits had long been aware that the Guild could not interfere directly with the vital spice source because Guild navigators already were dealing in their own inept way with higher order dimensions, at least to the point where they recognized that the slightest misstep they made on Arrakis could be catastrophic. It was a known fact that Guild navigators could predict no way to take control of the spice without producing just such a nexus. The obvious conclusion was that someone of higher-order powers *was* taking control of the spice source, yet the Bene Gesserits missed his point entirely!)

In the face of these facts, one is led to the inescapable conclusion that the inefficient Bene Gesserit behavior in this affair was a product of an even higher plan of which they were completely unaware!

XVI

"Of what did they seek to rob me?
Of my soul and body
Thrust into the dust!"

"The Old Man's Hymn" from "Arrakis Awakening"
by The Princess Irulan

The Baron Vladimir Harkonnen raged down the corridor from his private apartments, flitting through patches of late afternoon sunlight that poured down from high windows. He bobbed and twisted in his suspensors with violent movements.

Past the private kitchen he stormed—past the library, past the small reception room and into the servants' antechamber where the evening relaxation already had set in.

The guard captain, Iakin Nefud, squatted on a divan across the chamber, the stupor of *semuta* dullness in his flat face, the eerie wailing of *semuta* music around him. His own court sat near to do his bidding.

"Nefud!" the Baron roared.

Men scrambled.

Nefud stood, his face composed by the narcotic but with an overlay of paleness that told of his fear. The *semuta* music had stopped.

"My Lord Baron," Nefud said. Only the drug kept the trembling out of his voice.

The Baron scanned the faces around him, seeing the looks of frantic quiet in them, returned his attention to Nefud and spoke in a silken tone:

"How long have you been my guard captain, Nefud?" the Baron asked.

Nefud swallowed. "Since Arrakis, My Lord. Almost two years."

"And have you always anticipated dangers to my person?"

"Such has been my only desire, My Lord."

"Then where is Feyd-Rautha?" the Baron roared.

Nefud recoiled. "M'Lord?"

"You don't consider my nephew Feyd-Rautha a danger to my person?" Again, the voice was silken.

Nefud wet his lips with his tongue. Some of the *semuta* dullness left his eyes. "Feyd-Rautha's in the slave quarters, My Lord."

"With the women again, eh?" The Baron trembled.

"Sire, it could be he's—"

"Silence!"

The Baron advanced another step into the antechamber, noting how the men moved back, clearing space around Nefud, disassociating themselves with the object of wrath.

"Did I not command you to know precisely where the na-Baron was at all times?" the Baron asked. He moved a step closer. "Did I not say that you were to know *precisely* what the na-Baron was saying at all times—and to whom?" Another step. "Did I not say to you that you were to tell me whenever he went into the quarters of the slave women?"

Nefud swallowed. Perspiration stood out on his forehead.

The Baron held his voice flat, almost devoid of emphasis: "Did I not say these things to you?"

Nefud nodded.

"And did I not say you were to check all slave boys sent to me and you were to do this yourself . . . *personally*?"

Again, Nefud nodded.

"Did you, perchance, not see the blemish on the thigh of the one sent me this evening?" the Baron asked. "Is it possible—"

"Uncle!"

The Baron whirled, stared at Feyd-Rautha standing in the doorway. The presence of his nephew here, now—the look of hurry which the young man could not quite conceal—all revealed much. Feyd-Rautha had his own spy system focused on the Baron.

"There is a body in my chambers that I wish removed," the Baron said, and he kept his hand at the projectile weapon beneath his robes, thankful that his shield was the best.

Feyd-Rautha glanced at two guardsmen against the right wall, nodded. The two detached themselves, scurried out the door and down the hall toward the Baron's apartments.

Those two, eh? the Baron thought. *Ah, this young monster has much to learn yet about conspiracy!*

"I presume you left matters peaceful in the slave quarters, Feyd," the Baron said.

"I've been playing *cheops* with the slavemaster," Feyd-Rautha said, and he thought: *What has gone wrong? The boy we sent to my uncle has obviously been killed. But he was perfect for the job. Even Hawat couldn't have made a better choice. The boy was perfect!*

"Playing pyramid chess," the Baron said. "How nice. Did you win?"

"I . . . ah, yes, Uncle." And Feyd-Rautha strove to contain his disquiet.

The Baron snapped his fingers. "Nefud, you wish to be restored to my good graces?"

"Sire, what have I done?" Nefud quavered.

"That's unimportant now," the Baron said. "Feyd has beaten the slavemaster at cheops. Did you hear that?"

"Yes . . . Sire."

"I wish you to take three men and go to the slavemaster," the Baron said. "Garrot the slavemaster. Bring his body to me when you've finished that I may see it was done properly. We cannot have such inept chess players in our employ."

Feyd-Rautha went pale, took a step forward. "But, Uncle, I—"

"Later, Feyd," the Baron said, and waved a hand. "Later."

The two guards who had gone to the Baron's quarters for the slaveboy's body staggered past the antechamber door with their load sagging between them, arms trailing. The Baron watched until they were out of sight.

Nefud stepped up beside the Baron. "You wish me to kill the slavemaster, now, My Lord?"

"Now," the Baron said. "And when you've finished, add those two who just passed to your list. I don't like the way they carried that body. One should do such things neatly. I'll wish to see their carcasses, too."

Nefud said: "My Lord, is it anything that I've—"

"Do as your master has ordered," Feyd-Rautha said. And he thought: *All I can hope for now is to save my own skin.*

Good! the Baron thought. *He yet knows how to cut his losses.* And the Baron smiled inwardly at himself, thinking: *The lad knows, too, what will please me and be most apt to stay my wrath from falling on him. He knows I must preserve him. Who else do I have who could take the reins I must leave some day? I have no other as capable. But he must learn! And I must preserve myself while he's learning.*

Nefud signaled men to assist him, led them out the door.

"Would you accompany me to my chambers, Feyd?" the Baron asked.

"I am yours to command," Feyd-Rautha said. He bowed, thinking: *I'm caught.*

"After you," the Baron said, and he gestured to the door.

Feyd-Rautha indicated his fear by only the barest hesitation. *Have I failed utterly?* he asked himself. *Will he slip a poisoned blade into my back . . . slowly, through the shield? Does he have an alternative successor?*

Let him experience this moment of terror, the Baron thought as he walked along behind his nephew. *He will succeed me, but at a time of my choosing. I'll not have him throwing away what I've built!*

Feyd-Rautha tried not to walk too swiftly. He felt the skin crawling on his back as though his body itself wondered when the blow could come. His muscles alternately tensed and relaxed.

"Have you heard the latest word from Arrakis?" the Baron asked.

"No, Uncle."

Feyd-Rautha forced himself not to look back. He turned down the hall out of the servants' wing.

"They've a new prophet or religious leader of some kind among the Fremen," the Baron said. "They call him Muad'Dib. Very funny, really. It means The Mouse. I've told Rabban to let them have their religion. It'll keep them occupied."

"That's very interesting, Uncle," Feyd-Rautha said. He turned into the private corridor to his Uncle's quarters, wondering: *Why does he talk about religion?*

"Yes, isn't it," the Baron said.

They came into the Baron's apartments through the reception salon to the bedchamber. Subtle signs of a struggle greeted them here—a suspensor lamp displaced, a bedcushion on the floor, a soother-reel spilled open across a bedstand.

"It was a clever plan," the Baron said. He kept his body shield tuned to maximum, stopped facing his nephew. "But not clever enough. Tell me, Feyd, why didn't you strike me down yourself? You've had opportunity enough."

Feyd-Rautha found a suspensor chair, accomplished a mental shrug as he sat down in it without being asked.

I must be bold now, he thought.

"You taught me that my own hands must remain clean," he said.

"Ah, yes," the Baron said. "When you face the Emperor, you must be able to say truthfully that you did not do the deed. The witch at the Emperor's elbow will hear your words and know their truth or falsehood. Yes. I warned you about that."

"Why haven't you ever bought a Bene Gesserit, Uncle?" Feyd-Rautha asked. "With a Truthsayer at your side—"

"You know my tastes!" the Baron snapped.

Feyd-Rautha studied his uncle, said: "Still, one would be valuable for—"

"I trust them not!" the Baron snarled. "And stop trying to change the subject!"

Feyd-Rautha spoke mildly: "As you wish, Uncle."

"I remember a time in the arena several years ago," the Baron said. "It seemed there that day a slave had been set to kill you. Is that truly how it was?"

"It's been so long ago, Uncle. After all, I—"

"No evasions, please," the Baron said, and the tightness of his voice exposed the rein on his anger.

Feyd-Rautha looked at his uncle, thinking: *He knows, else he wouldn't ask.*

"It was a sham, Uncle. I arranged it to discredit your slavemaster."

"Very clever," the Baron said. "Brave, too. That slave-gladiator almost took you, didn't he?"

"Yes."

"If you had finesse and subtlety to match such courage, you'd be truly formidable." The Baron shook his head from side to side. And as he had done many times since that terrible day on Arrakis, he found himself regretting the loss of Piter, the Mentat. There'd been a man of delicate, devilish subtlety. It hadn't saved him, though. Again, the Baron shook his head. Fate was, sometimes, inscrutable.

Feyd-Rautha glanced around the bedchamber, studying the signs of the struggle, wondering how his uncle had overcome the slave they'd prepared so carefully.

"How did I best him?" the Baron asked. "Ahhh, now, Feyd—let me keep some weapons to preserve me in my old age. It's better we used this time to strike a bargain."

Feyd-Rautha stared at him. *A bargain! He means to keep me as his heir for certain, then. Else why bargain. One bargains with equals or near equals.*

"What bargain, Uncle?" And Feyd-Rautha felt proud that his voice remained calm and reasonable, betraying none of the elation that filled him.

The Baron, too, noted the control. He nodded. "You're good material, Feyd. I don't waste good material. You persist, however, in refusing to learn my true value to you. You are obstinate. You do not see why I should be preserved as someone of the utmost value to you. This"—he gestured at the evidence of the struggle in the bedchamber— "was foolishnss. I do not reward foolishness."

Get to the point, you old fool! Feyd-Rautha thought.

"You think of me as an old fool," the Baron said. "I must dissuade you of that."

"You speak of a bargain."

"Ahh, the impatience of youth," the Baron said. "Well, this is the substance of it, then: You will cease these foolish attempts on my life. And I, when you are ready for it, will step aside in your favor. I will retire to an advisory position, leaving you in the seat of power."

"Retire, Uncle?"

"You still think me the fool," the Baron said, "and this but confirms it, eh? You think I'm begging you! Step cautiously, Feyd. This old fool saw through the shielded needle you'd planted in that slaveboy's thigh. Right where I'd put my hand on it, eh? The smallest pressure and—snick! A poison needle in the old fool's palm! Ahhh, Feyd—"

The Baron shook his head, thinking: *It would've worked, too, if Hawat hadn't warned me. Well, let the lad believe I saw the plot on my own. In a way, I did. I was the one saved Hawat from the wreckage of Arrakis. And this lad needs greater respect for my prowess.*

Feyd-Rautha remained silent, struggling with himself. *Is he being truthful? Does he really mean to retire? Why not? I'm sure to succeed him one day if I move carefully. He can't live forever. Perhaps it was foolish to try hurrying the process.*

"You speak of a bargain," Feyd-Rautha said. "What pledge do we give to bind it?"

"How can we trust each other, eh?" the Baron asked. "Well, Feyd, as for you: I'm setting Thufir Hawat to watch over you. I trust Hawat's Mentat capabilities in this. Do you understand me? And as for me, you'll have to take me on faith. But I can't live forever, can I Feyd? And perhaps you should begin to suspect now that there're things I know which you *should* know."

"I give you my pledge and what do you give me?" Feyd-Rautha asked.

"I let you go on living," the Baron said.

Again, Feyd-Rautha studied his uncle. *He sets Hawat over me! What would he say if I told him Hawat planned the trick with the gladiator that cost him his slavemaster? He'd likely say I was lying in the attempt to discredit Hawat. No, the good Thufir is a Mentat and has anticipated this moment.*

"Well, what do you say?" the Baron asked.

"What can I say? I accept, of course."

And Feyd-Rautha thought: *Hawat! He plays both ends against the middle . . . is that it? Has he moved to my uncle's camp because I didn't counsel with him over the slaveboy attempt?*

"You haven't said anything about my setting Hawat to watch you," the Baron said.

Feyd-Rautha betrayed anger by a flaring of nostrils. The name of Hawat had been a danger signal in the Harkonnen family for so many years . . . and now it had a new meaning: still dangerous.

"Hawat's a dangerous toy," Feyd-Rautha said.

"Toy! Don't be stupid. I know what I have in Hawat and how to control it. Hawat has deep emotions, Feyd. The man without emotions is the one to fear. But deep emotions . . . ah, now, those can be bent to your needs."

"Uncle, I don't understand you."

"Yes, that's plain enough."

Only a flicker of eyelids betrayed the passage of resentment through Feyd-Rautha.

"And you do not understand Hawat," the Baron said.

Nor do you! Feyd-Rautha thought.

"Who does Hawat blame for his present circumstances?" the Baron asked. "Me? Certainly. But he bested me for years until the Imperium took a hand. That's how he sees it. His hate for me is a casual thing now. He believes he can best me any time. Believing this, he is bested. For I direct his attention where I want it—against the Imperium."

Tensions of a new understanding drew tight lines across Feyd-Rautha's forehead, thinned his mouth. "Against the Emperor?"

Let my dear nephew try the taste of that, the Baron thought. *Let him say to himself: "The Emperor Feyd-Rautha Harkonnen!" Let him ask himself how much that's worth. Surely it must be worth the life of one old uncle who could make that dream come to pass!*

Slowly, Feyd-Rautha wet his lips with his tongue. Could it be true what the old fool was saying? There was more here than there seemed to be.

"And what has Hawat to do with this?" Feyd-Rautha asked.

"He thinks he uses us to wreak his revenge upon the Emperor."

"And when that's accomplished?"

"He does not think beyond his revenge. Hawat's a man who must serve others, and doesn't even know this about himself."

"I've learned much from Hawat," Feyd-Rautha agreed, and felt the truth of the words as he spoke them. "But the more I learn, the more I feel we should dispose of him—and soon."

"You don't like the idea of him watching you?"

"Hawat watches everybody."

"And he may put you on a throne. Hawat is subtle. He is dangerous, devious. But I'll not yet withhold the antidote from him. A sword is dangerous, too, Feyd. We have the scabbard for this one, though. The poison's in him. When we withdraw the antidote, death will sheath him."

"In a way, it's like the arena," Feyd-Rautha said. "Feints within feints within feints. You watch to see which way the gladiator leans, which way he looks, how he holds his knife."

He nodded to himself, seeing that these words pleased his uncle, but thinking: *Yes! Like the arena! And the cutting edge is the mind!*

"Now, you see how you need me," the Baron said. "I'm yet of use, Feyd."

A sword to be wielded until he's too blunt for use, Feyd-Rautha thought.

"Yes, Uncle," he said.

"And now," the Baron said, "we will go down to the slave quarters, we two. And I will watch while you, with your own hands, kill all the women in the pleasure wing."

"Uncle!"

"There will be other women, Feyd. But I have said that you do not make a mistake casually with me."

Feyd-Rautha's face darkened. "Uncle, you—"

"You will accept your punishment and learn something from it," the Baron said.

Feyd-Rautha met the gloating stare in his uncle's eyes. *And I must remember this night,* he thought. *And remembering it, I must remember other nights.*

"You will not refuse," the Baron said.

What could you do if I refused, old man? Feyd-Rautha asked himself. But he knew there might be some other punishment, perhaps a more subtle one, a more brutal lever to bend him.

"I know you, Feyd," the Baron said. "You will not refuse."

All right, Feyd-Rautha thought. *I need you now. I see that. The bargain's made. But I'll not always need you. And . . . some day—*

XVII

Deep in the human unconscious is a pervasive need for a logical universe that makes sense. But the real universe is always one step beyond logic.

"The Sayings of Muad'Dib"
by The Princess Irulan

I've sat across from many rulers of Great Houses, but have never seen as gross and dangerous a pig as this one, Thufir Hawat told himself.

"You may speak plainly with me, Hawat," the Baron rumbled. He leaned back in his suspensor chair, the eyes in their folds of fat boring into Hawat.

The old Mentat looked down at the table between him and the Baron Vladimir Harkonnen, noting the opulence of its grain. Even this was a factor to consider in assessing the Baron, as were the red walls of this private conference room and the faint sweet herb scent that hung on the air, masking a deeper musk.

"You didn't have me send that warning to Rabban as an idle whim," the Baron said.

Hawat's leathery old face remained impassive, betraying none of the loathing he felt. "I suspect many things, My Lord," he said.

"Yes, well I wish to know how Arrakis figures in your suspicions about Salusa Secundus. It is not enough that you say to me the Emperor is in a ferment about some association between Arrakis and his mysterious prison planet. Now, I rushed the warning out to Rabban only because the courier had to leave on that Heighliner. You said there could be no delay. Well and good. But now I will have an explanation."

He babbles too much, Hawat thought. *He's not like Leto who could tell me a thing with the lift of an eyebrow or the wave of a hand. Nor like the Old Duke who could express an entire sentence in the way he accented a single word. This is a clod! Destroying him will be a service to mankind.*

"You will not leave here until I've had a full and complete explanation," the Baron said.

"You speak too casually of Salusa Secundus," Hawat said.

"It's a penal colony," the Baron said. "The worst riffraff in the galaxy are sent to Salusa Secundus. What else do we need to know?"

"That conditions on the prison planet are more oppressive than anywhere else," Hawat said. "You hear that the mortality rate among new prisoners is higher than sixty per cent. You hear that the Emperor practices every form of oppression there. You hear all this and do not ask questions?"

"The Emperor doesn't permit the Great Houses to inspect his prison," the Baron growled. "But he hasn't seen into my dungeons, either."

"And curiosity about Salusa Secundus is . . . ah"—Hawat put a bony finger to his lips— "discouraged."

"So he's not proud of some of the things he must do there!"

Hawat allowed the faintest smile to touch his dark lips. His eyes glinted in the glowtube light as he stared at the Baron. "And you've never wondered where the Emperor gets his Sardaukar?"

The Baron pursed his fat lips. This gave his features the look of a pouting baby, and his voice carried a tone of petulance as he said: "Why . . . he recruits . . . that is to say, there are the levies and he enlists from—"

"Faaa!" Hawat snapped. "The stories you hear about the exploits of the Sardaukar, they're not rumors, are they? Those are first-hand accounts from the limited number of survivors who've fought against the Sardaukar, eh?"

"The Sardaukar are excellent fighting men, no doubt of it," the Baron said. "But I think my own legions—"

"A pack of holiday excursionists by comparison!" Hawat snarled. "You think I don't know why the Emperor turned against House Atreides?"

"This is not a realm open to your speculation," the Baron warned.

Is it possible that even he doesn't know what motivated the Emperor in this? Hawat asked himself.

"Any area is open to my speculation if it does what you've hired me to do," Hawat said. "I am a Mentat. You do not withhold information or computation lines from a Mentat."

For a long minute, the Baron stared at him, then: "Say what you must say, Mentat."

"The Padishah Emperor turned against House Atreides because the Duke's warmasters, Gurney Halleck and Duncan Idaho, had trained a fighting force—a *small* fighting force—to within a hair as good as the Sardaukar. Some of them were even better. And the Duke was in a position to enlarge his force, to make it every bit as strong as the Emperor's."

The Baron weighed this disclosure, then: "What has Arrakis to do with this?"

"It provides a pool of recruits already conditioned to the bitterest survival training."

The Baron shook his head. "You cannot mean the Fremen?"

"I mean the Fremen."

"Hah! Then why warn Rabban? There cannot be more than a handful of Fremen left after the Sardaukar pogrom and Rabban's oppression."

Hawat continued to stare at him silently.

"Not more than a handful!" the Baron repeated. "Rabban killed six thousand of them last year, alone!"

Still, Hawat stared at him.

"And the year before it was nine thousand," the Baron said. "And before they left, the Sardaukar must've accounted for at least twenty thousand."

"What are Rabban's troop losses for the past two years?" Hawat asked.

The Baron rubbed his jowls. "Well, he has been recruiting rather heavily, to be sure. His agents make rather extravagant promises and—"

"Shall we say thirty thousand in round numbers?" Hawat asked.

"That would seem a little high," the Baron said.

"Quite the contrary," Hawat said. "I can read between the lines of Rabban's reports as well as you can. And you certainly must've understood my reports from our agents."

"Arrakis is a fierce planet," the Baron said: "Storm losses can—"

"We both know the figure for storm accretion," Hawat said.

"What if he has lost thirty thousand?"

"By your own count," Hawat said, "he killed fifteen thousand over two years while losing twice that number. You say the Sardaukar accounted for another twenty thousand, possibly a few more. And I've seen the transportation manifests for their return from Arrakis. If they killed twenty thousand, they lost almost five for one. Why won't you face these figures, Baron, and understand what they mean?"

The Baron spoke in a coldly measured cadence: "This is your job, Mentat. What do they mean?"

"I gave you Duncan Idaho's head count on the sietch he visited," Hawat said. "It all fits. If they had just two hundred and fifty such sietch communities, their population would be about five million. My best estimate is that they had at least twice that many communities. You scatter your population on such a planet."

"Ten million?"

The Baron pursed his fat lips. The beady eyes stared without wavering at Hawat. *Is this true Mentat computation?* he wondered. *How could this be and no one suspect?*

"We haven't even cut heavily into their birth-rate-growth figure," Hawat said. "We've just weeded out some of their less successful specimens, leaving the strong to grow stronger—just like on Salusa Secundus."

"Salusa Secundus!"

"A man who survives Salusa Secundus starts out being tougher than most others," Hawat said.

"Nonsense! By your argument, *I* could recruit from among the Fremen after the way they've been oppressed by my nephew."

Hawat spoke in a mild voice: "Don't you oppress any of your troops?"

"Well . . . I . . . but—"

"Oppression is a relative thing," Hawat said. "Your fighting men are much better off than those around them, heh? They see unpleasant alternatives to being soldiers of the Baron, heh?"

The Baron fell silent, eyes unfocused. The possibilities—Had Rabban unwittingly given House Harkonnen its ultimate weapon?

Presently, he said: "How could you be sure of the loyalty if such recruits?"

"I would take them in small groups, not larger than platoon strength," Hawat said. "I'd remove them from their oppressive situation and isolate them with a training cadre of people who understood their background, preferably people who had preceded them from the same oppressive situation. Then I'd fill them with the mystique that their planet had really been a secret training ground to produce just such superior beings as themselves. And all the while, I'd show them what such superior beings could earn: rich living, beautiful women, fine mansions . . . whatever they desired."

The Baron began to nod. "The way the Sardaukar live at home."

"The recruits come to believe in time that such a place as Salusa Secundus is justified because it produced them—the elite. The commonest Sardaukar trooper lives a life, in many respects, as exalted as that of any member of a Great House."

"Where did such a thing start?" the Baron asked.

"Ahh, yes: Where did House Corrino originate? Were there people on Salusa Secundus before the Emperor sent his first contingents of prisoners there? Even the Duke Leto, a cousin on the distaff side, never knew for sure. Such questions are not encouraged."

The Baron's eyes glazed with thought. "Yes, a very carefully kept secret. They'd use every device of—"

"Besides, what's there to conceal?" Hawat asked. "That the Padishah Emperor has a prison planet? Everyone knows this. That he has—"

"Count Fenring!" the Baron blurted.

Hawat broke off, studied the Baron with a puzzled frown. "What of Count Fenring?"

"At my nephew's birthday several years ago," the Baron said. "This Imperial poppinjay, Count Fenring, came as official observer and to . . . ahh, conclude a business arrangement between the Emporer and myself."

"So?"

"I . . . ahh, during one of our conversations, I believe I said something about making a prison planet of Arrakis. Fenring—"

"What did you say exactly?" Hawat asked.

"Exactly? That was quite a while ago and—"

"My Lord Baron, if you wish to make the best use of my services, you must give me adequate information. Wasn't this conversation recorded?"

The Baron's face darkened with anger. "You're as bad as Piter! I don't like these—"

"Piter is no longer with you, My Lord," Hawat said. "As to that, what ever *did* happen to Piter?"

"He became too demanding of me," the Baron said.

"You assure me you don't waste a useful man," Hawat said. "Will you waste me by threats and quibbling? We were discussing what you said to Count Fenring."

Slowly, the Baron composed his features. *When the time comes,* he thought, *I'll remember his manner.*

"One moment," the Baron said, and he thought back to the meeting in his great hall. It helped to visualize the cone of silence in which they had stood. "I said something like this," the Baron said. " 'The Emperor knows a certain amount of killing has always been an arm of business.' I was referring to our work-force losses. Then I said something about considering another solution to the Arrakeen problem and I said the Emperor's Prison Planet inspired me to emulate him."

Hawat snapped. "What did Fenring say?"

"That's when he began questioning me about you."

Hawat sat back, closed his eyes in thought. "So that's why they started looking into Arrakis," he said. "Well, the thing's done." He opened his eyes. "They must have spies all over Arrakis by now. Two years!"

"But certainly my innocent suggestion that—"

"Nothing is innocent in an Emperor's eyes! What were your instructions to Rabban?"

"Merely that he should teach Arrakis to fear us."

Hawat shook his head. "You now have two alternatives, Baron. You can kill off the natives, wipe them out entirely, or—"

"Waste an entire work force?"

"Would you prefer to have the Emperor and those Great Houses he can still swing behind him come in here and perform a curettement, scrape out Giedi Prime like a hollow gourd?"

The Baron studied his Mentat, then: "He wouldn't dare!"

"Wouldn't he?"

The Baron's lips quivered. "What is your alternative?"

"Abandon your dear nephew, Rabban."

"Aband—" The Baron broke off, stared at Hawat.

"Send him no more troops, no aid of any kind. Don't answer his messages other than to say you've heard of the terrible way he's handled things on Arrakis and you intend to take corrective measures as soon as you're able. I'll arrange to have some of your messages intercepted by Imperial spies."

"But what of the spice, the revenues, the—"

"Demand your Baronial profits, but be careful how you make your demands. Require fixed sums of Rabban."

The Baron turned his hands palms up. "But how can I be certain that my weasel nephew isn't—"

"We still have our spies on Arrakis. Tell Rabban he either meets the spice quotas you set him or he'll be replaced."

"I know my nephew," the Baron said. "This would only make him oppress the population even more."

"Of course he will!" Hawat snapped. "You don't want that stopped now! You merely want your own hands clean. Let Rabban make your Salusa Secundus for you. There's no need even to send him any prisoners. He has all the population required. If Rabban is driving his people to meet your spice quotas, then the Emperor need suspect no other motive. That's reason enough for putting the planet on the rack. And you, Baron, will not show by word or action that there's any other reason for this."

"How do we move into Arrakis and make use of what Rabban prepares?"

"That's the simplest thing of all, Baron. If you set each year's quota a bit higher than the one before, matters will soon reach a head there. Production will drop off. You can remove Rabban and take over yourself . . . to correct the mess."

"It fits," the Baron said. "But I can feel myself tiring of all this. I'm preparing another to take over Arrakis."

Hawat studied the fat round face across from him. Slowly, the old soldier-spy began to nod his head. "Feyd-Rautha," he said. "So that's the reason for the oppression now. You're very devious yourself, Baron. Perhaps we can incorporate these two schemes. Yes. Your Feyd-Rautha can go to Arrakis as their savior."

The Baron smiled. And behind his smile, he asked himself: *Now, how does this fit in with Hawat's personal scheming?*

And Hawat, seeing that he was dismissed, arose and left the red-walled room. As he walked, he could not put down the disturbing unknowns that cropped into every computation about Arrakis. This new religious leader that Gurney Halleck hinted at from his hiding place among the smugglers, this *Muad'Dib.*

Perhaps I should not have told the Baron to let this religion flourish where it will, even among the folk of pan and graben, he told himself. *But it's well known that repression makes a religion flourish.*

He thought about Halleck's reports on Fremen battle tactics. They smacked of Halleck, Idaho . . . and himself.

Did Duncan Idaho survive? Thufir Hawat asked himself.

But this was a futile question. He did not yet ask himself if it was possible that Paul had survived. He knew the Baron was convinced that all Atreides were dead. The Bene Gesserit witch had been his weapon, the Baron admitted. And that could only mean an end to all—even to the woman's own son.

What a poisonous hate she must've had for the Atreides, he thought. *Something like the hate I hold for this Baron. Will my blow be as final and complete as hers?*

To be Continued

DESIDERATA

GO PLACIDLY AMID THE NOISE & HASTE, & REMEMBER WHAT PEACE THERE MAY BE IN SILENCE. AS FAR AS POSSIBLE WITHOUT surrender be on good terms with all persons. Speak your truth quietly & clearly; and listen to others, even the dull & ignorant; they too have their story. ❧ Avoid loud & aggressive persons, they are vexations to the spirit. If you compare yourself with others, you may become vain & bitter; for always there will be greater & lesser persons than yourself. Enjoy your achievements as well as your plans. ❧ Keep interested in your own career, however humble; it is a real possession in the changing fortunes of time. Exercise caution in your business affairs; for the world is full of trickery. But let this not blind you to what virtue there is; many persons strive for high ideals; and everywhere life is full of heroism. ❧ Be yourself. Especially, do not feign affection. Neither be cynical about love; for in the face of all aridity & disenchantment it is perennial as the grass. ❧ Take kindly the counsel of the years, gracefully surrendering the things of youth. Nurture strength of spirit to shield you in sudden misfortune. But do not distress yourself with imaginings. Many fears are born of fatigue & loneliness. Beyond a wholesome discipline, be gentle with yourself. ❧ You are a child of the universe, no less than the trees & the stars; you have a right to be here. And whether or not it is clear to you, no doubt the universe is unfolding as it should. ❧ Therefore be at peace with God, whatever you conceive Him to be, and whatever your labors & aspirations, in the noisy confusion of life keep peace with your soul. ❧ With all its sham, drudgery & broken dreams, it is still a beautiful world. Be careful. Strive to be happy. ❧ ❧

FOUND IN OLD SAINT PAUL'S CHURCH, BALTIMORE; DATED 1692

The Legend of Ernie Deacon

WILLIAM F. TEMPLE

Illustrated by Dean West

In the world of subjective reality it can be very difficult indeed to define "Fact"!

My sword darted swift as one of my own famous arrows. Via my wrist, I felt its point glance off a rib. A flash of agony lit Sir Roderick's eyes. Then all life left them. My blade was through his heart.

His weight as he fell wrenched the hilt from my fingers. He lay, white face up, on the dark green grass in the shade of an oak tree. Thick blood spread slowly on his tunic.

My fighting fury ebbed, gave place to serene triumph. Justice had been done. They that live by the sword shall perish by the sword. Truisms were true, and everyone knew who and where they were and what they stood for.

Or did they?

The dead Sir Roderick said: "I love you, Robin."

Moreover, he said it in Maid Marian's voice.

I said, listening to myself incredulously: "Draw thy sword, Sir Roderick, for but one of us shall leave this glade alive."

The said glade immediately quivered like a mirage. A huge, ghostly drawbridge crashed down in the middle of it, silently raising dust clouds. A troop of mounted Norman knights galloped across the bridge and through the trees. Not between the trees: *through* them.

Suspension of disbelief collapsed. I removed the headset and switched off the Teo.

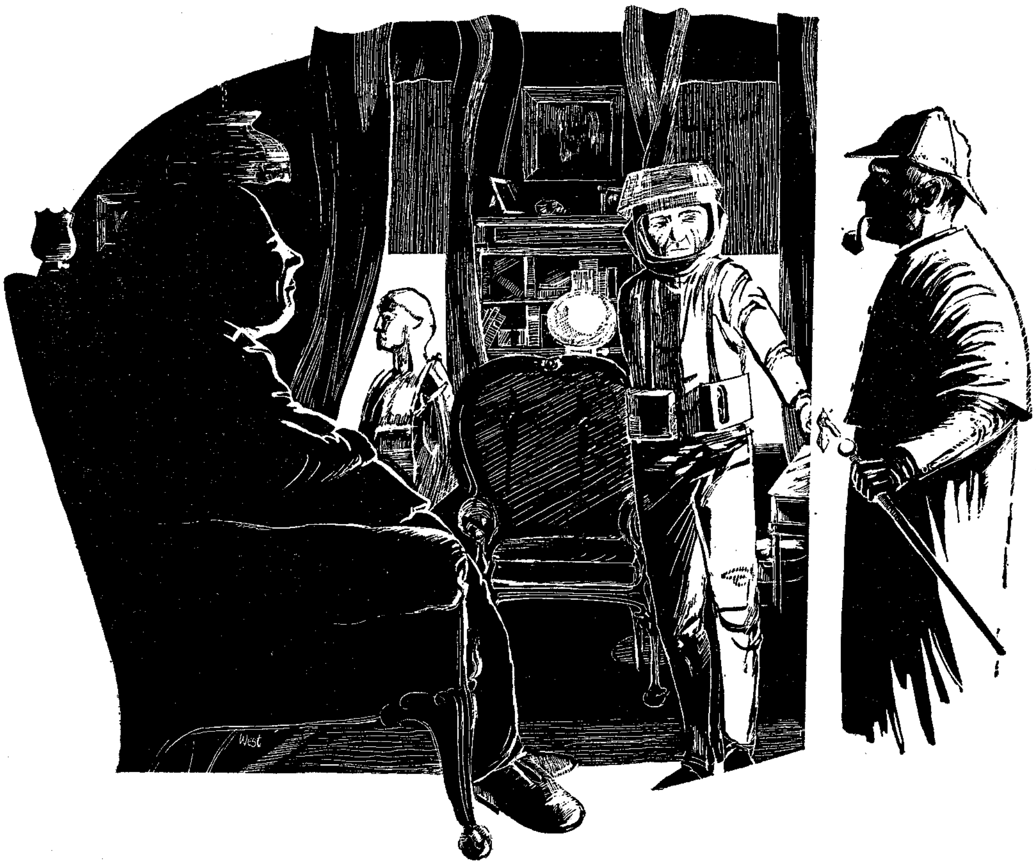
"Yes, the Asps were right to throw this lot back at us. Every last spool's a dud. Sound and vision completely out of phase, for one thing. You think you're going crazy."

Ernie pointed out: "Every spool is stamped 'Tested and Passed.' "

"Doesn't mean a thing, Ernie. You know how those inspectors go about it. They test one Teo spool at random out of a batch, then pass the whole batch. Thirty-seven spools returned this time. Thirty-seven kilos of *varos* lost to Earth—enough to treat maybe five thousand people. It's a wicked shame. I'm filing a complaint at top-level directly when we get back."

"Sure, you do that," said Ernie, absently.

I studied him. "I've a notion you couldn't care less."



"I wouldn't say that, Art. But I wish I could care more. It's a worthwhile job, I suppose. I thought it was for me, but it isn't. Whoever made the stars set them too far apart for humans. Life's too short."

"Maybe it's just that you're too young, Ernie. You know, I was against your appointment. I told the Board you were too young. You've really got to be through with women on this job."

"Darn it, Art, it's not woman trouble. It's . . . being pent up in this ship. Restlessness, boredom, frustration. I want to be *doing* something."

"About what?"

"About my career. I want to *be* someone, Art."

I knew then I'd lost him. This would be his first and last trip. Well, I could go it alone, if necessary. I'd done it before. In fact, at heart I was a loner, like most dreamers.

Still, I'd miss Ernie. He was an idealist and an enthusiast for life. "Real" life, he termed it, as opposed to dream life. I was older and—I kidded myself—wiser. I suspected that "real" life itself was just a dream, as Prospero had said.

"What kind of someone?" I asked.

"Well, for instance, I'd like to be the guy who finds the secret of growing *varos* on Earth. Someone's going to pull it off, sooner or later. I wish it could be me."

"And throw me out of a job?"

Ernie smiled. "That could be the best thing that ever happened to you, Art. Then you might begin to get somewhere instead of being batted to and fro like a ping-pong ball."

I smiled, too. I was older and—remember—wiser.

"I'm where I always wanted to be, son: sitting on a cloud, watching the world go by."

"There'd be no parade to watch unless some folk got up off their seats and started going somewhere."

"True enough," I said. And then Tigot waddled in from his cabin, where he spent most of the time recumbent, running through his favorite Teo spools, of which he never tired. The bulk of them featured Sherlock Holmes.

Asps always waddle. They're all fat from inaction: the long-term result of automation plus. Spidery robots tended them from the cradle to the urn. Also, sowed, reaped, treated, and packaged *varos:* the plants which refused to take root in any soil or compost on Earth. Which made it tough for Earth. For the treated *varos* was the only known cure for the otherwise fatal blood condition which many Terrestrials had contracted, and passed to their offspring, from the excess of radioactive waste.

Earth bartered Teo dream spools for *varos.*

In a sense, it was exchange of life for life. Until the Earthman came, the Asps were being stifled by their own boredom. This Terrestrial invention offered them new life.

"Only a dream life," Ernie would sniff. But dreams can be very real, and the Teo-induced kind were exceptionally so. Everything was on the tape: vision, sound, color, smell, tactile sensations. They were projected directly into the relevant brain centers.

Earthmen used them, too, but generally only for relaxation. They weren't enslaved addicts, as the Asps had become. Earthmen still had to work for their living.

Tigot greeted me with a grin and: "There was the curious incident of the dog in the nighttime."

I returned, smartly: "The dog did nothing in the nighttime."

"That was the curious incident," he laughed, and patted my shoulder. "You're coming along nicely, Arthur. You'll be one of us yet."

"One of us" meant a member of the Sherlock Society, of which he was President. This was the Asparian equivalent of the Baker Street Irregulars, still flourishing on Earth. Devotees of the Holmes cult. I was one myself in an uncommitted way. I was temperamentally unable to join the conspiracy to pretend Holmes had really lived. I preferred to read the stories, see him as a Paget illustration, rather than dream I was he—or, alternative role, Dr. Watson gasping at his brilliance—through the Teo.

Asps didn't often visit Earth. They're not incurious, just lazy. Also, the round trip absorbed eighteen months. Tigot was a special case. He was on a pilgrimage to London, representing his Society, to visit the haunts of Holmes. A labor of love: his idolatry was extreme.

Inactive nonproducers, the Asps had few colorful characters among their own race. The Teo opened up a whole new heroic world for them. Each had his particular favorite, and they were childlike in their self-identification.

Tigot's great ambition was to walk on Baker Street. It was worth traveling more than four light-years to do simply that.

I pointed out that Conan Doyle hadn't even seen Baker Street when he conceived Sherlock Holmes. Tigot just smiled and shrugged. Even more than humans, Asps believed what they wished to believe.

Ernie was amusedly contemptuous of the Asparian way of life. He liked Tigot but couldn't resist ribbing him.

"Coming out for air after breathing all that fog?"

Tigot replied, evenly: "The fog stimulates me. All the wonderful mysteries emerge from it."

"You won't find any fog along Baker Street nowadays," said Ernie. "Nor a lump of the coal which caused it. Nor yet a single hansom cab. Queen Victoria is dead."

"Possibly. But Holmes is immortal."

"You're right," I said. "Doyle killed him once, but he came back from the grave."

"Holmes," said Tigot, "was no ordinary man, but a spirit. You can't kill a spirit."

I didn't pursue the matter. You can't have a logical discussion with folk who use entirely different terms of reference. Even so, I understood the Asp outlook far better than Ernie. As a commuter I had a foot in both worlds.

I could be hard and practical. Also, I could abandon myself to dreaming. I knew the function of every instrument in my ship and could explain it in technical terms. At the same time, I knew that such terms explained nothing really. That they merely described methods of using forces of whose basic nature we were ignorant. That the ship itself, its immensely tough hull, its mass of machinery, was once no more tangible than a dream in a designer's mind. For the material world is just the dream world frozen hard.

In a sense, everybody and everything is mind-stuff. Including Sherlock Holmes.

Then my instruments warned me that the ship was nearing the frontier of the solar system, and I must switch to my practical role and make planet-fall.

I had a parting drink with Ernie in a Spaceport bar. He reaffirmed that he would resign next day. I didn't try to dissuade him.

He said: "Aspar is just one big opium den. And you're playing drug-peddler to the junkies, Art. Pardon my bluntness."

I did, because he was semidrunk.

"You're wasting your life," he said.

"It's my life, Ernie. For me, the only life. Manwatching is my fad: observing mankind in the making. The normal growth-rate is too gradual to register. But time dilation gives you an accelerated motion picture: twelve-year hops for the price of only eighteen months. It's like walking through history in seven-league boots."

He regarded me hazily over the rim of his glass.

"A thousand ages in your sight is but as an evening gone . . . You get a kick out of feeling like some minor god, then?"

"I don't think of it that way. Here's how I'll spend my furlough. I'll look around and see what's actually happened about the new ideas and projects that were in the air here a dozen years back. What ideas took root, how they've shaped. What ideas died, and why. I'm plumb eager to learn what kind of a harvest we're getting. Then I'll take a look at what's new in seedlings. I'll mull 'em over in my mind during the next trip out and see what I can make of them myself. Then come back here and see what man's really done with them—or what they've done with him. The onlooker sees most of the game, you know."

"That's O.K., Art, if you're a born onlooker. But I want to *play*. Remember Jake Herren?"

"Sure. Your pal. A mechanic here."

"He was . . . twelve years ago. Now he's Chief Engineer. He's been climbing the promotion ladder three rungs at a time. What have I been doing all these years? Riding guard over a cargo of pickled plants."

"Which plants, incidentally, will save thousands of lives. Isn't that something?"

"Oh, sure. But what about *my* life?"

"You took the job with your eyes open, Ernie. Quit whining. Jake's aged better than ten years on you—don't forget that."

"Oh, I know. I'm Peter Pan. I never grow up. Hell, I feel awful."

He pushed his glass aside. I stared at him. His face was sweat-damp and pale. He looked bad. I called a taxi, took him home, left in the care of his sister. His morale was dragging along the ground. He seemed bewildered, like a man who had missed his way in the dark and become dis-orientated.

Next morning his sister phoned. Ernie's doctor had advised he be taken to the hospital for observation. The ambulance had just left. I told her I'd keep in touch. I did, for some days. No news. No change. Then, behind schedule, I jetted off on my global roundup of developments in the realm of ideas.

In London, in the Space Club, I ran into Tigot again. He insisted I share his ecstasy: a walk on Baker Street. So I did.

Lower Baker Street was a long way from Victoria's age: almost entirely rebuilt. Monolithic blocks of offices and flats towered above the nose-to-tail traffic. But the upper length of the Street, close to Regents Park, remained much as it had been a century ago. Here Holmes was supposed to have lived, at No. 221-B. No such number, of course.

But Tigot held that the only fictitious thing was the number. The house was still there. He pointed it out. Both the Irregulars and the Sherlock Society had tracked it down. He even showed me Camden House—and that was still the name over the door—which was described as "The Empty House" in the story which brought Holmes back to life and introduced the formidable Professor Moriarty.

Tigot's fat cheeks were flushed with excitement. I marveled again at the way the Asps could live in a world of fantasy and juggle the facts to make it seem real. I said as much.

Tigot said, seriously: "My race is much older than yours. We've learned what you find it hard to understand: facts are the children of imagination. It's only through the eye of the imagination that you see the true picture of this strange universe. If imagination is strong and pure, unsullied by doubt, its truth is the only truth. Facts are simply what they're imagined to be."

"True facts can be verified," I said. "Imagined ones can't."

Tigot promptly launched a complex argument purporting to show that verification was also imagination. It confused me and I waved him to silence after a while.

"All right, I go some of the way with you. But nothing can persuade me to believe that Holmes was anything more than a creation by Conan Doyle."

"Are you anything more than a creation by your parents?"

I laughed. "Of all the obvious false analogies! Look, Tigot, Doyle didn't even know what to call his detective. He fumbled over names—it was 'Sherrinford Holmes' at one time."

"But didn't your parents hesitate over what names to give you?"

I was silently thoughtful. He'd scored there. Instead of "Arthur" I was very nearly "Arnold," my mother once told me. But was it any more than a debating point, mere verbal cleverness?

I found myself recalling a visit to Dorset, the Hardy County, in this country long ago. The guide took us to the farm where Tess of the d'Urbervilles had labored as a milkmaid and the church where she'd married Angel Clare. My fellow tourists became alert with interest. Those places meant something. The church at Stinton, where Thomas Hardy's heart was interred, scarce got a glance. The creator was relatively unimportant, his creations everything.

A famous fictional inhabitant of Hong Kong was Suzie Wong. The hotel called the "Nam Kok" was still visited by her admirers. Somehow, she'd acquired flesh and bones. When I visited Hong Kong, people would tell me how their grandfathers often saw her in the dives after she'd taken to the opium pipe.

The World of Suzie Wong actually existed for those who believed in it.

In Berlin they'll show you the haunts of Harry Lime, born of a fiction, "The Third Man."

The Cornish folk love to show you the ruins of King Arthur's Castle at Tintagel. The ruins are real enough. But was King Arthur? Maybe, in a queer kind of way.

And Robin Hood? Ask the Asps. They believe he was as real as Sherwood Forest undoubtedly is.

Even human kids know he was real, just as they know Santa Claus exists—for from whom else do the presents come? The parents chuckle quietly. They know better. They know where the presents came from. But do they—

really? The real origin was the legend, and spirit, of Santa Claus.

Long-running TV soap operas persuade millions that their characters are real people. A script-writer dictates—he thinks—that one should fall ill. Flowers, fruit, letters by the truckload pour into the studios. Not for the script-writer, for few of the donors even know his name. He is a shadow. His creation is three-dimensional.

And when such a character is written out in the brutal way, killed off, the grief is nation-wide. No new thing. The whole world cried over the death of Little Nell, though none was more heartbroken than Charles Dickens. Yet he was in the position to know better than any of the other mourners that she never really existed at all.

Or did she?

If these creatures are so real to skeptical Terrestrials, there was small chance of my convincing an Asp that he was a victim of his own delusions.

As if he were reading my thoughts, Tigot broke in: "Every day, for more than a century now, letters arrive in London addressed to Holmes at No. 221-B imploring his help. Did you know that?"

I didn't, but I could believe it. I'd reached a state of mind where I could believe almost anything.

On the way back we glimpsed, down river, the gray dome of St. Paul's.

Tigot commented: "Every cathedral in this world of yours was built from belief and not from ascertainable knowledge. Belief, Arthur, is everything."

Chasing ideas, I found myself back-tracking to New York. Bad news about Ernie awaited me. He had polio and was paralyzed from the waist down. Even *varos* was no answer to polio.

I felt terrible about it. How much worse he must feel. He couldn't endure confinement, and now he was to be confined to a wheelchair for life.

I shrank from going to see him, but went.

We had quite a talk. During it he said: "Don't feel too bad about me, Art. Everything has its compensations. I always wanted to be someone but I was never sure who I wanted to be. That made me pretty miserable. I had this blind drive conflicting with the realization that I had no special talent of any kind. Medical research attracted me most, I suppose, but I don't have the kind of brain it takes."

"Maybe not, but you were doing a good job for medicine ferrying *varos* to Earth."

"Nothing personal, Art, but any slob could do that. I imagined it was a man's job: braving the perils of space to get the *varos* through. Ta-ra-ra! Hell, there weren't any perils. There's more danger on the freeways. It was like serving a term in some kind of windowless prison cell. You're surrounded by a billion stars but you can't see even one of them. I couldn't take the tedium or the claustrophobia. Now I don't have to. I don't have to make any decisions. That's a relief, man, that's my compensation. I've got me an alibi. I'm a cripple. Now no one can expect me to become someone."

He laughed, but I could see the despair behind it. Idealists have a tough time. The superego nags them to death if they fall short of their ideals. That's the way they're made and you can't change them.

Yes, it was quite a talk. But it didn't solve anything.

I knew Tigot was due in New York as a guest of the Irregulars. Soon, I looked him up. He was being banquetted like royalty and his girth was ridiculous. His eyes were just slits between folds of fat and gleamed with good humor.

I described Ernie's predicament and Tigot considered it. He'd often been Ernie's butt but never resented it. He knew youth was a rebellious phase and was tolerant of it.

"You can tell a boy's aspirations by his heroes," he observed, presently.

"Ernie's were Pasteur, Lister, Fleming, Ehrlich . . . oh, almost every pioneer in medical research."

Tigot nodded. "Also Irving, Kean, Booth, Olivier, the Barrymores . . . almost every great actor. Perceive any pattern in that duality?"

"Pattern?"

"Psychological pattern."

I rubbed my chin. "Are you hinting at schizophrenia?"

"Don't sound condemnatory, Arthur. All art is a form of controlled schizophrenia."

"But Ernie's no artist."

"How do you know? He's still fumbling for self-expression. My guess is he can't get onto his true path because it's barred—by a chunky mental/emotional block. But he knows where his goal lies. It lies in the center of a pool."

"Pool?" I was becoming just an echo.

"A pool of bright, ego-warming limelight. The Mecca of every actor."

"Act—" I strangled the echo. "You think Ernie's just hunting glory? His motive's simple attention-getting, like a child's?"

"The need for signficance is a basic one for both Terrestrials and Asps. If you fail to win it by achievement, you tend to assume it in imagination. As we Asps do continually. As an actor assumes a role. Ernie admits he lacks the analytical mind of a top research man. So he would like to dream he was one. But he admires men of action and despises dreamers. So he begins to despise himself. The conflict is painful. To ease it, he needs an excuse for his inaction. Naturally, he wouldn't consciously infect himself with polio. But sub-consciously a man can lower his guard against disease."

"Be that as it may, Tigot, the tests have shown his case to be incurable. Nothing can be done now."

"I disagree. Something can be done. Ernie should be made to see that he's choking his own special talent by despising it. That young man is a natural actor."

More thoughtful chin massage for me. "Tigot, you could be right. But how many parts are there for a semi-paralyzed . . . Oh, I get you: the Teo."

"I was talking to a producer only yesterday, Arthur. There're plenty of actors who can walk and talk convincingly—on the surface. But the spools go *below* the surface. The calculated, puppet-type acting just doesn't get across—the strings show. Only the Stanislavsky approach works with the Teo. Don't just pretend you're a character: *be* that character. Wholeheartedly, sincerely. There's a shortage of actors who can do that. Ernie could do it, because Ernie was meant to do it."

"I'd have a tough time convincing him of it, I'm afraid."

"Yes, you would. You said it yourself. You're afraid—afraid you might be wrong. You can't convince anyone of anything unless you're convinced yourself. Well, I'm convinced. And I'll convince Ernie, too."

Tigot did just that. How, I don't know, for I wasn't there. I was at a marine station in the South Pacific where conditioned dolphins were responding to the sight of simple words. One day, I told myself, I'll be in business with the dolphins—with Teo spools.

When I made New York again, I was still behind schedule. Only a day remained before blast-off. I spent it trying to contact Ernie, and failed. Teo Spools Inc. were his bosses now. They were tough. They kept him incommunicado at the studio where he was working all hours to complete his first feature. It was a pilot effort they wanted to ship to Aspar right away—on my ship.

It meant recording far into the night. I hoped Ernie was standing up to the strain.

Tigot made the return passage with me. He was free as air, but I was, as usual, madly busy the first day out, setting and checking the course. I recalled Ernie's quip about this chore: "Simple enough. Second to the right, and straight on till morning." Those were Peter Pan's directions for reaching the Neverland—and Ernie derisively called Aspar the Neverland.

Yes, I'd miss him this trip.

Well, I did and I didn't. For he was there with us—on a spool. Tigot ran it through thrice that first day, and told me: "Arthur, we're justified. Ernest Deacon will become a name, all right. He's great. You'll enjoy the experience."

One "experiences" spools. When I got around to experiencing Ernie's, I agreed with Tigot's verdict. "The Healer" was written by Ernie himself, with some help from a pro-spool author. It was the story of a man who, by chance, discovered he was a faith healer. At first, by the touch of his hands. Later, merely to touch his robe was enough. Ironically, he was a paraplegic who could cure other paraplegics but not—somehow—himself.

He became besieged by multitudes. They devoured his life. His wife scarcely ever saw him. Finally, she delivered an ultimatum. He must ration the attention he gave the sick, and give more to her. Else she would leave him.

This tore him apart. He loved and needed her. Yet he couldn't bring himself to turn away the sufferers and prolong their pain even for a day.

Basically, the old "love versus duty" plot. But Ernie's performance lifted it out of the rut and gave it blazing life. As the spool spun, it was *you* who was being torn asunder. *You* who saw the pain leave a woman's eyes, and relief, then devotion, fill them because you touched her. *You* who saw devotion leave another woman's eyes and pain fill them, because you had no time to touch her: she was your wife and she was not ill.

Later, she *would* become ill, from losing you. And then pride would forbid her coming to you to be cured, because you had already rejected her.

And then, in the end . . . But everyone knows that story, literally by heart: for it comes from the heart to the heart.

Corn? Maybe. But when you're experiencing it, the critical sense is drugged. You become hypnotized.

I told Tigot: "This is going to hit Terrestrials right where they live—I don't know about your folk. It'll sell the series on sight, and be the making of Ernie. Though I don't see how he can ever better this performance."

Tigot said: "My people will love it, too. I agree it's a hard one to follow up. When I last saw Ernie, he was planning to play his heroes—Pasteur and the rest—in the next batch. Well, he's a born actor. Maybe he'll get away with it. But the Healer is Ernie dramatizing himself, not thinking himself into another man's skin. He's projecting a cherished private fantasy from deep inside. He gives it all he's got. The big question now is: does he have enough left to give to the other roles?"

The big question was never answered. Ernie died suddenly a few days after completing "The Healer."

The radio waves bearing this news took eighty days to overhaul my ship, which was traveling almost as fast as they were. I was shocked by the stupidity of it as much as anything. Just as he'd found his true metier, Ernie's youth, talent, and ambition had been trampled into the ground.

This news would reach Aspar well ahead of me, of course. When I got there, the Asps would already know that Ernie's series could never materialize, that the pilot spool joined onto nothing. They might well refuse it, and another kilo of *varos* would be lost.

Tigot said not to worry: "The Healer" was a unique gem, and he would bang the big drum for it.

But, happily, he had no need to. The radio waves trickling past us were heavy with praise of it. As I'd predicted, it was a smash hit on Earth, and was pre-sold when we reached Aspar. The Asps were standing in line to bid for reproduction rights. I got seven kilos for it. Ernie would have been pleased.

When I set foot on Earth again a dozen years—Terrestrial standard—later, the Ernie Deacon legend was deep-rooted. Already fact and fantasy were inseparable.

It was believed that Ernie's story contained a high percentage of autobiography. (All authors find this a common assumption by laymen.) That he'd certainly possessed some healing power himself. When I queried this with his sister, she said the only possible basis for it could be the fact that sometimes he'd eased her headaches by massaging the back of her neck.

But the character of The Healer went on metamorphosizing into reality as though some law of nature.

The chalet near the studio where Ernie had lived during the making of the spool became a kind of temple. Here were kept his holy relics: his wheelchair, his rack of pipes, and—most potent—the robe he'd worn on the set. Touch the robe, believing, and you would be healed —or, at the least, lifted onto the road to recovery.

It became a rival to Lourdes. Be as skeptical as you like, but if you were honest with it as you judged the recorded cases you had to admit that inexplicable—even medically impossible—cures had happened there.

So they began to happen in that little chalet.

Yet Ernie Deacon was no saint. Just a likable, ordinary guy, who'd gotten a bit mixed up and ended as an actor. No—not "ended." That was the beginning. He ended as a legend.

I watched the legend grow like a magic beanstalk over the decades as I batted to and fro. It was a seed watered by hope, nourished by belief, until it bore the fruits of fact. The facts were indisputable. Pilgrims *were* cured. Even radiation sickness, in its early stages, was often completely checked. I could see Ernie throwing me out of a job yet . . .

The Healer was an archetype even to the Asps, who were almost disease-free. Their rare serious illnesses were usually the consequence of overweight and lack of exercise.

All the same, I was surprised at the increasing numbers pilgrimaging to Ernie's little house. Usually it takes more than just a hope to persuade an Asp to walk a block, let alone travel several light-years.

My really big surprise came the day Tigot boarded my ship again. He confided he had fatty degeneration of the heart and had decided to join the pilgrims. Talking with him, I found he had more than just a hope. He had faith.

And this struck me as ridiculous. I didn't tell him so, though. You can't attempt to destroy a sick man's faith in his eventual cure.

But—Tigot, of all people! He who knew better than anyone what made Ernie tick. Who talked him into becoming an actor. Who knew "The Healer" was pure fiction.

How could such an intelligent person so deceive himself?

But then I realized that time had been at work on Tigot's memories of Ernie far longer than on mine. About eight times as long. And time gradually but constantly refashions events in the minds of Asps and Terrestrials alike.

I recalled the case of Dillinger, the gangster, in the 1920s. The legend, started by a newspaper reporter, was that he'd made his famous jailbreak bluffing with a wooden gun. In fact, it had been a real gun, smuggled in. But the legend was more colorful and so it overcame the truth. In the end, Dillinger himself believed the legend. although he was the man who'd actually handled the gun.

Again, there were the sourdoughs of the Yukon Gold Rush of 1898 who believed in their declining years that they'd witnessed the actual shooting of Dan McGrew. No use telling them that Dan McGrew never existed, except in the mind of poet Service, who'd never even set foot in the Yukon when he wrote that saga.

Time had worked on their memories.

I suspect this kind of transmutation can happen to all of us who knew the real truth. Or thought we knew.

I hope so. For when I brought Tigot to Earth that second time it was my last voyage. Soon afterwards, I was compulsorily retired as medically unfit. Arthritis. Painful and disabling.

Yet I'm still comparatively young. And I hate living at this slow-motion pace. It isn't really living to me. I feel like a genie corked in a bottle. I yearn for the old, free, swinging strides through history.

There remains one ray of hope that I might yet be healed and return to the wide ranges of space-time. And that is the legend of Ernie Deacon. I'm not ready to accept it completely yet but I'm aware of the steady pressure of its persuasiveness.

Give it time. ■

the long-lost powers

We refer here, however, not to any mystical Powers,
but to Mr. William T. Powers, author of a number of stories,
including "Allegory," which appeared in our April 1953 issue.
Anybody know where he is?
The Post Office doesn't, and here we are with a check
for a couple hundred bucks, and nobody to give it to . . .
Royalties on anthology reprint of his story. THE EDITOR

THE TWENTY LOST YEARS OF SOLID-STATE PHYSICS

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be seen and tested. No theories are involved. The inventor is only required to say, "Here is my invention, described so you can do it, too." The fact the inventions are sometimes hard to duplicate by a stranger is due to an untrained hand and eye in that particular sequence of manipulations, whatever it happens to be. Just watch someone who has never done it before try to run a simple titration.

Lilienfeld's transistor cannot be dismissed as a lucky shot in the dark, produced by a moment of gifted insight. He understood so thoroughly what he had that he later issued two more patents on the same subject matter. In U. S. Patent No. 1,877,140, granted 13 September 1932, he claims an amplifier for electric currents. To make the amplifier he encloses a layer of magnesium metal between two layers of cuprous sulfide. He makes up the layers in such a way that a junction is formed at each magnesium-cuprous sulfide boundary. Both junctions are biased in the reverse direction. The resulting device is clearly an NPPN transistor, and Lilienfeld even points out the dangers of using too high biasing voltages; the structure breaks down. He also says that by reversing the order of the metallic layers, the biasing has to be reversed, and there's your PNNP transistor. The drawings in the patent all have the same familiar look of the three leads in a modern transistor circuit.

The final Lilienfeld patent is U. S. Patent No. 1,900,018, granted 7 March 1933. Here he uses the cuprous sulfide with oxidized aluminum, and his circuit diagram shows he has another version of an NPN transistor with a common emitter circuit. He also describes a reversed biased P-N junction used as a variable capacitor.

So there was not one, but three patents, all concerned with what was to become the most heralded discovery in the science of physics since the electron tube. There can be no doubt that these patents were reviewed by many of the country's foremost physicists and electrical engineers. It has long been the practice in research laboratories of all kinds to order each week any patents which may be of interest to the people who work there. Patents are issued by the United States Patent Office every Tuesday, and the descriptions are mailed around the world. Yet the Lilienfeld patents stirred no interest.

It wasn't until about 1950 that the junction transistor came into its own. On 3 October 1950, U. S. Patent No. 2,524,035 was granted. It, too, was one of three patents, but all of these were granted on the same day. They all had the same title: Three-Electrode Circuit Element Utilizing Semiconductive Materials. Claim 40 of U.S. 2,524,035 reads:

> A circuit element comprising a body of semiconductor material, one portion of which is of one conductivity type and another portion of which is of a different conductivity type, an emitter electrode engaging the first portion of the body, a collector electrode engaging the body to collect current flowing to the body by way of said emitter electrode, and a base electrode providing a low-resistance connection to said other portion of the body to vary the magnitude of said current.

The theory to explain junction transistors had finally been developed, and at last the world noticed.

It is time to wonder how such a delay can come about. In these days of burgeoning technology the loss of twenty years is an incalculable setback. Yet somehow our culture operates to effectively suppress the results of the rare surge of some man's genius. We are all suspicious of what we don't understand. In the several fields of science this suspicion is compounded by the fact that the woods are full of crackpots. The things we don't understand are likely to be put down as the work of a crackpot. Most of the time they are. But these viewpoints make it possible to miss a profound invention among the patents that will issue next Tuesday. The invention could be missed despite the fact that technical personnel from the Armed Forces now keep an eye on all pending patent applications, looking for things that might be useful in any manner to the armed might of the country. But it isn't enough. All the scientific people that now look over the week's issue of patents suffer from one devastating shortcoming: they look for the things they recognize. And as long as they seek recognizable technology, they will never find the invention that lies beyond any theories to explain it.

Once we realize that orthodoxy neither produces nor locates the pathfinder invention, a solution immediately suggests itself. The week's patents should be reviewed for those inventions that are *not* recognizable. An open-minded specialist should look at all patents that remotely touch his specialty. Any that seem absurd, or illogical, or ridiculous, or that make no sense at all, should be set aside for further study. In these days of group effort and scientific conformity, an open-minded specialist may be hard to come by, but they are around. Mostly they are among the younger ones with only a few years of experience. They are the ones who have not been hammered completely into orthodoxy. They are around.

Perhaps the technical societies or the universities could perform this service to the scientific community. Specialists from each of several sciences could be assigned the task of looking for the unorthodox. A couple of organic chemists, a couple of physicists, and a couple of electronic experts might do for a starter. The more overlapping the better. All of them would be ready to winnow the inventions that do not make sense. The group would constitute a kind of Board of Unorthodox Technology. If in twenty years of operation such a Board could uncover one invention comparable to Lilienfeld's invention of the junction transistor, it would all be worth it. ■

THE CASE OF THE PARADOXICAL INVENTION

continued from page 16

transit through the magnetic field?

A vast body of scientific knowledge and technological experience exists on this subject. The design of such diverse equipments as mass spectrographs, cyclotrons and cathode-ray tubes, to name but a few, is based on this same charged-particle-magnetic-field interaction. The principle, as applied in these cases, demands that the velocity remain constant; that it might *not* be so seems virtually inconceivable.

And yet the possibility that the particle velocity—and therefore the kinetic energy—might decrease *under some conditions* must at least be considered, for the reaction-force must exist. The difficulty may stem from the fact that all of the above-mentioned devices which use the same physical principle have been, by definition, "stationary field" devices; they certainly have not been designed to register any reaction forces acting on the field. The inertia of the structures supporting or producing the magnetic fields in these cases would be far too great for the small reaction forces that would exist in practice. In other words, the velocity has always been observed as constant because the magnetic-field structure has always been unable to yield the reaction-force produced—and thus presumably to carry off any of the particle's kinetic energy—even when the geometry of the particle-motion—that is to say, something less than a full-circle path—would permit a net reaction-force to exist. A light-weight properly designed rotor structure would presumably yield to the reaction-torque, causing the particles to lose energy in the process.

If this is the case, then the basic tenet of the original objection—that the speed of the particles remains constant *under all conditions* during the interaction, and that this constancy renders the invention workable—is wrong. Admittedly, the idea that the velocity *can* decrease necessitates some changes in motor design philosophy. For example, if the velocity decreases, the radius also decreases as the particles move out from the source—since the radius is proportional to the velocity. Therefore, either the extent of the field must be carefully limited or the strength of the field must decrease with radial distance if the particles are not to turn back into the field and cancel any reaction. Once again, however, this is simply an engineering design problem. Other than this, the device must work as originally specified. What is more important, the loss of kinetic energy by the particles in inducing an opposite motion in the field demands some alteration of the field-particle interaction law.

If this is *not* the case—if the velocity does, in fact, remain constant under all conditions—then the original objection stands. But this leads directly into a singular dilemma.

The core of the dilemma is this: do the particles produce a reaction force on the field, or not? If they do, then the conservation of energy is apparently violated, since the work done on the rotor would have to come from no evident source. If they do *not*, then the third law of motion has been violated. In other words, where does the energy necessary for moving the rotor come *from* in the first case—or *to* where does the energy go that should result from the reaction on the field, in the second case?

The voice of orthodox physics will probably raise at this point an as yet unconsidered characteristic of charged-particle-magnetic-field interaction—the so-called "synchrotron radiation"—and thus assume that the second case above is the pertinent one. The synchrotron radiation is simply electromagnetic radiation produced by the centripetal acceleration given the charged particles by the field; its energy is proportional to the fourth power of the particle energy and inversely proportional to the radius of the turning motion. It might be an ample enough mechanism for "carrying off" the reaction-force energy, but it is a most selective and unlikely one. However, the existence of the synchrotron radiation itself raises another possible point of issue: is the radiation actually emitted as a result of the transverse acceleration of the particles by the field—or is the particle interaction with the field simply such that a transverse radiation is emitted as a result, thus accelerating the particle transversely by simple momentum? In other words, is the radiation a *result* of the particle's turning motion, or is it the *cause*? If the latter were the case, then the motor would indeed not work. The action-reaction would be confined to the particle and the radiation.

However, the synchrotron radiation is really of no consequence whatever in the present paradox. If it is assumed that the radiation *is* the actual cause of the transverse force on the particle—there is no valid reason for assuming this; in fact, the turning acceleration on the particles is almost unquestion-

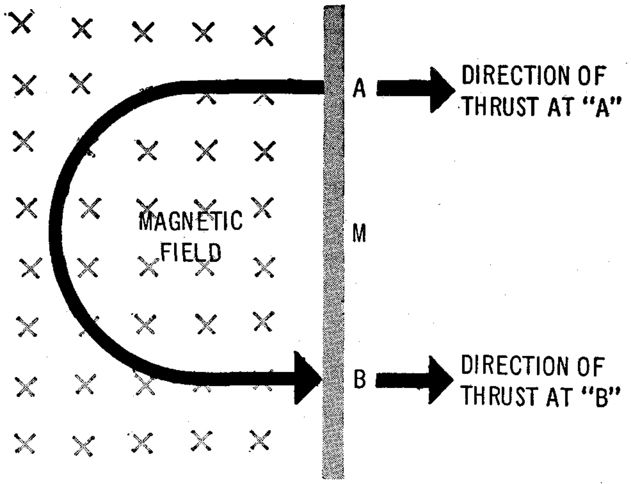

Figure 3. Schematic Reactionless Thrust System

ably a centripetal acceleration caused by the field—then a contradictory unilateral thrust device, which is outlined below, must be possible. If, as conventional theory maintains, it is simply produced by the field-induced centripetal acceleration of the particles, it still only tends to reinforce the unilateral thrust of the same improbable device, unless a reaction-force acts on the field.

The principles of this singular reactionless propulsion technique can be described quite briefly; they are really just those of the mass spectrograph. The principles of the original invention are extended so that the charged particles are turned through a full 180-degrees before leaving the field. In this case, as shown in Figure 3, the following conditions prevail:

The particles are ejected from their source at A, producing a conventional and unquestionable reaction-force in the opposite direction on the source-structure M, as shown. They're turned through 180-degrees by the magnetic field—with no reaction-force on the field, now, since this is the condition demanded by the argument against the possibility of work being done on the rotor in the original device—impacting the source again at point B and once again producing a conventional reaction-force on M in the same direction as that produced at A! Thus, under the terms of the original objection to the motor invention, a unidirectional reactionless propulsion technique would appear possible that not only defies the third law of motion but the conservation of energy as well, since the particles would presumably be reusable or usable for other purposes, particularly if they were electrons.

The point is that, if the particle's kinetic energy is undiminished and the original motor concept does *not* work, then the above-described reactionless drive *must.* The choice is: either violate the conservation of energy, or violate both the conservation of energy *and* the third law of motion. The only alternative to this incredible situation is the workability of the original motor-device in which the particles lose energy to the rotor and do work in the process. As has already been pointed out, this alternative also demands some revamping of its underlying laws.

It should be emphasized that the 180-degree reactionless drive outlined above should not be taken too seriously. It was introduced only to illustrate that the argument against a reaction torque in the original form of the invention had to be wrong. For the reaction-force is a centrifugal force. The existence of a centrifugal reaction can scarcely be denied in this single case of curvilinear motion and demanded in every other case.

In the end, there is no hard and fast answer to the original problem. Perhaps the existence of the paradox serves to verify the conclusions of Dr. William Davis and his concept of "critical action time." (See "The Fourth Law of Motion" by Dr. William O. Davis, Analog, May, 1962). Certainly the action times in the present case are extremely small; average velocities of alpha particles are on the order of 10^9 cm/sec, while beta particles often approach light speed.

In any case, it seems unavoidable that one or another fundamental law must be altered to some degree. At the very least, the law governing the interaction of charged particles moving in a transverse magnetic field must be amended. The potential value of the original device as an energy-conversion mechanism is almost immaterial at this point. The big question is a theoretical one: why should such a contradiction in basic laws be possible?

Whatever the solution, it is a question much in need of answering. ■

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ONE MAN'S "ASTOUNDING"

At about the time of the World Science Fiction Convention in Berkeley, California, Advent—the fan publisher which is just about the sole survivor of a distinguished crew which once included Shasta, Fantasy, Gnome and Prime presses, F.P.C.I., and Hadley—brought out a book by Alva Rogers, entitled "A Requiem for Astounding" (Advent: Publishers, P.O. Box 9228, Chicago, Illinois 60690; 1964; 224 pp.; ill.; $6.00). You'd have heard about it three months ago if a mailing label hadn't been mislaid, but I trust there are still copies left on the Advent shelves.

This is a book that is hard to classify. It is not quite history and not entirely bibliography, although it is a running chronicle of the development of Astounding Science Fiction through thirty years. It was kindled as a talk to the Golden Gate Futurians of Berkeley, shortly after Astounding became Analog—then expanded into six long articles for *Viper*, a fanzine, and finally filled out still more and lavishly illustrated with well reproduced cover paintings and interior illustrations from the magazine. It is further enriched by an affectionate introduction by the magazine's first editor, Harry Bates, putting on the record his version of the somewhat controversial circumstances of its genesis. F. Orlin Tremaine, first editor under the Street & Smith banner, adds a few comments and John Campbell, who took over late in 1937 and made the magazine the leading force in science fiction, has a characteristically dissenting statement. He resents the term "requiem": the vigorous caterpillar, Astounding, has become the glorious imago, Analog, but the organism is by no means in need of mourners.

To over-simplify, this book is Alva Rogers' perhaps over-nostalgic recollection of a fascinating creature he knew and loved long ago when he, and John Campbell, and science fiction, and Astounding were all young. He lets his memory drift from issue to issue through the years, recalling the stories, the covers, the illustrations that shook him then and still do. To him, the magazine's—and science fiction's—Golden Age began in 1941, when John Campbell had finally impressed his personality and vision on the entire genre, and dimmed into a still-shiny Silver Era in 1947. Maturity came with the 1950s, when Astounding was "the only magazine consistently presenting 'adult' science fiction," but the last ten years are covered swiftly in two short chapters.

The author obviously has different tastes in science fiction than I—he doesn't much care for the technical stories which attracted so many scientists to the magazine—but I find myself fondly remembering the same great stories, and the effect they had on me. He certainly overdoes the detailed synopses of the stories he enjoyed—and often ignores stories he didn't—but they are intentionally recounted for the benefit of present-day readers to whom the Astounding of the Golden Age will be forever legend.

For the old-timers who were reading Astounding then, "Requiem" is the next best thing to reliving those days. And they *were* great days—the "Elizabethan Age" of science fiction. Today's magazine is different and so is science fiction: more modern, more sophisticated, more adult, perhaps more intellectual and less gut-jarring. Today's generation doesn't read magazine fiction for entertainment; it watches TV, and to a degree has grown numb to what happens when powerful words, astounding ideas, and suspenseful plots came down on you every month like an avalanche. Reading "Requiem for Astounding" just may give them an inkling of what it was like to read the magazine twenty-odd years ago.

At the Washington Convention I tried to sell the idea that some of the greatest of these old yarns, such as "Doc" Smith's "Lensman" stories in their original serial form, and A. E. van Vogt's best work, gained much of their impact through a skillful "snow job" which persuaded their readers that they were revealing the real inner truths of science. I remember the "Skylark" yarns, and John Campbell's own super-physics series, for the conviction that this was the stuff of the universe that only Einstein and "Doc" Smith and John—and now their readers—understood. By today's lights, their physics was fantasy—but it convinced, and it threw open the universe in the pages of Astounding, from the atoms to the stars.

So, in its way, does "A Requiem for Astounding."

THE REST OF THE ROBOTS

By Isaac Asimov • Doubleday & Co., Garden City, N. Y. • 1964 • 536 pp. • $5.95

This is beyond doubt Doubleday's science fiction bargain of 1964. Not long ago, when I reported the new Doubleday reprint of "I, Robot," I complained that nobody had collected the rest of Isaac Asimov's robot stories. Now here they are: seven short stories, one novelette, and the two complete novels whose hero is R. Daneel Olivaw, the robot detective. With them—and I wish Doubleday had done the same with their version of "I, Robot"—are characteristically Asimovian commentaries, setting the stories in the framework of the series, explaining how and why they were written.

All but one of the stories in the original collection were first published here in Astounding Science Fiction, and Asimov's famous Three Laws of Robotics were woven into the genre here. Only two of the stories in the new collection are from Astounding: the short story, "Risk"—probably the best of them—and the second novel, "The Naked Sun." (We're promised this is not the end: there will some day be a third novel about Lije Baley and R(obot) Daneel.)

The first two stories, "Robot AL-76 Goes Astray" and "Victory Unintentional," are a kind of prelude to the "positronic robot" series, which concern the struggles of Dr. Susan Calvin and others of U.S. Robot and Mechanical Men's scientists and engineers to design better and better robots, and to get the public to accept them. In the first, a well-meaning, bewildered robot is hunted down; in the second, a trio of robots unintentionally hornswoggle the very nasty inhabitants of Jupiter.

Having set up his Laws of Robotics, their creator—like John Dickson Carr with his locked-room mysteries—diligently set about trying to find ways to seem to break them. If this statement is ambiguous to you, read the stories. "First Law" tells of a robot that violated it and left a man to die in a storm on Titan. "Let's Get Together," one of the best, offers the problem of finding ten perfect replicas of human beings, each carrying part of a nuclear bomb, who have been infiltrated into the millions of people in the continental United States. "Satisfaction Guaranteed" is a kind of prototype for the TV series in which Julie Newmar plays the robot. (Could there be a new Asimov SF Award in the shape of a figure of Julie—awarded first to Ike?)

"Risk," here in Astounding in 1955, is my own favorite: Susan Calvin proves herself a thorough psychologist in a critical situation, when a man must be sent to do a robot's job. "Lenny" is really a Calvin story rather than a robotics yarn—yet its theme is a very basic one. "Galley Slaves" finds U.S. Robot in court, in a very nasty bind over a proofreading robot that seems to have exceeded its authority.

And then there are the novels, two classics, "The Caves of Steel" and "The Naked Sun," which are good and legitimate mysteries, good and legitimate robot stories, and fascinating prognostications of what mankind can do to itself. And there's that third book, partly written, yet to come . . .

ANCIENT RUINS AND ARCHAEOLOGY

By L. Sprague de Camp and Catherine C. deCamp • Doubleday & Co., Garden City, N.Y. • 1964 • 294 pp. • Ill. • $5.95

I have spared you my enthusiasm for good books of popular archaeology of late, except for some notes on Robert Silverberg's excellent juvenile series. In part, this is because the trend has been back to the "Gods, Graves and Scholars" gambit of books about the adventures of archaeologists, instead of about what they have found. I had about come to the conclusion that I would avoid any more books about the diggers rather than the dug . . . and now, along comes the de Camps' book, which weaves both together in precisely the way it should be done. The result—and I assure you this is high praise—reads much like one of the better all-night discussions at a fabulous archaeological conference of world scope.

Twelve packed chapters carry the reader to twelve ancient places—not quite all cities—which have been focuses of myth, fable and fantasy since they were first rediscovered. Usually we get the magic first; then comes the story of science probing, dissecting, fitting scattered facts together like the shards of a broken pot to regain a semblance if the one-time reality. When the diggers' lives and exploits help illumine the story, they are here; when they are not needed, they are omitted.

It is a world-girdling series. Atlantis, and the lost city of Tertessos that may have given rise to the story. The pyramids and the fantasies built on them. Stonehenge, and the realities as strange as the myths. The nine buried cities of Troy . . . Ma'rib, home of the Queen of Sheba . . . Zimbabwe and the tales of King Solomon's mines . . . Tintagel and the legend of King Arthur.

Then there are the fabled ruins of the regions that Europe discovered only a few hundred years ago. Angkor, as deeply buried in the neglected histories of Southeast Asia as in the jungle. Tikal of the Mayas, which has drawn nonsense as it once drew worshipers. Machu Picchu of the crags—with an aside for that other lodestone of myth, Tiahuanaco. Nan Matol—real and strange, but not quite as strange as Merritt made it in "The Moon Pool." And finally Rapa Nui—Easter Island—around whose "eyeless watchers" controversy still seethes.

Needless to say, every one of these sites could have been the subject of a separate book and all of them have elicited many books. Sprague and Catherine de Camp have done wonders in sifting out the facts, spicing them with the best of the fancy, and above all giving their readers the "feel" of the places. There are other ruins as strange and stories as wonderful to be told. Let's hope Doubleday asks for more.

THE RIM OF MORNING

By William Sloane • Dodd, Mead & Co., New York • 1964 • 295 + 307 pp. • $5.00

This new title conceals an omnibus volume with two of the finest original science-fiction stories of the 1930s. Although the author—later head of the publishing firm that bore his name—was thoroughly familiar with science fiction, and later edited two good anthologies, these books—"To Walk the Night" in 1937 and "The Edge of Running Water" in 1939—appeared with no warning and were missed by many readers. They have been reprinted since, but this is a rare opportunity to get them in one package.

"To Walk the Night" is one of my all-time favorites. It is a mystery with a steadily strengthening thread of fantasy that eventually envelopes the whole. A solitary astronomer has died mysteriously, and the friend who marries his widow finds himself enmeshed in the same strange web, not explained until the very end. In a very different way, Selina Le Normand is a kind of present-day "She," and as memorable.

"The Edge of Running Water" is more gadgety, but no less well done; some readers like it better. This is the story of a physicist's attempt to devise a machine that will communicate with his dead wife. His experiments are carried on against the growing hostility of his neighbors, in a remote house on the New England coast, and come to an unexpected end.

Many another writer has and still does make a mish-mash of these familiar themes. Sloane, not long out of college, handled them beautifully and nearly thirty years later they are as good as ever.

OF WORLDS BEYOND

Edited by Lloyd Arthur Eshbach • Advent: Publishers, P.O. Box 9228, Chicago, Ill. 60690 • 1964 • 104 pp. • $3.50

THE SCIENCE FICTION NOVEL: IMAGINATION AND SOCIAL CRITICISM

Advent, Chicago • 2nd Edition, 1964 • 160 pp. • $3.50

Advent, praised elsewhere for its 1964 bombshell, "A Requiem for Astounding," has also reprinted two of the best discussions of what science fiction is and how and why it keeps on ticking.

"Of Worlds Beyond" is a writers' symposium assembled for and by Lloyd Eshbach in 1947, as a Fantasy Press bonus. The contributors were John Campbell, Dr. Edward E. Smith, Robert A. Heinlein, L. Sprague de Camp, Jack Williamson, A. E. van Vogt and John Taine (Eric Temple Bell). Taine is now dead. Williamson, de Camp and van Vogt have not been writing fiction lately, and "Doc" Smith hasn't been writing much. The examples they discuss may not be familiar to some of you, but what they say is still just about as valid as it was nearly twenty years ago. Advent has indexed the book for this reprint edition.

"The Science Fiction Novel" is Advent's own baby—the text of a series of lectures given at the University of Chicago in the winter of 1957, and collected and augmented for publication in 1959. I haven't the first edition at hand and don't see much change in this new one, unless the index is new. The theme of the book is science fiction's role as an instrument of effective social criticism, and the arguments rage vigorously pro and con. Contributing are Basil Davenport—an introduction—Robert Heinlein, the late C. M. Kornbluth, Alfred Bester, and Robert Bloch.

These Advent books are examples of the best serious publishing science fiction fandom is doing. If it's not your meat, persuade your library to get them—then read them yourself. Hellfire—buy 'em, read 'em, and then give 'em to the library!

THE LOST COMET

By Stanton A. Coblentz • Arcadia House, New York • 1964 • 188 pp. • $2.95

This is another of the books with which a publisher of teen-age romances is attempting to make a mark in the science-fiction field. It reads like something the author may have written before Hugo Gernsback launched *Amazing Stories* in 1926, and failed to sell to him then.

This is not one of Stanton Coblentz's heavy-handed satires, which at least have something to say. It is a kind of Jules Verne magnificent invention story with a cast of typed characters who step forward with placards around their necks to make clear their parts in the melodrama. Super-Inventor Stephen Rathbone intends to reclaim the Arctic for mankind by drilling a hole into the bowels of the Earth and using the heat of the deep mantle to boil water which will in turn be pumped to the surface to heat the surrounding countryside. In his vacuum-filled dirigible, *Comet*, he takes a large crew to a secret island near the pole. Here, using the famed "universal solvent" which he has just happened to discover, he proposes to dissolve his hole to the lava level, but is wholly unable to handle it when he gets it. Meanwhile the *Comet* has been wrecked, the party is marooned, food is running out, the Bad Men are getting in their licks, the Weakling is just as yellow as he seemed from the start . . . you must know the rest.

I suggest this is really an oldie because Rathbone's ultramodern laboratory has the zinc-topped tables of the pre-World-War-I Era—even then, most labs were using stone—the universal solvent—which doesn't attack the pumps that remove it from the dissolved pit—is big stuff, and so are dirigibles. The volcano on Icy Isle squirts liquid iron in a remarkable fashion and the stars shine by day in the Arctic summer. When two men vanish into the pit, the rescuers don't bother to look for them for two days and never mention them again. Welding torches are used to close a fissure in the rock in the bottom of the pit . . . which would certainly be reopened immediately, even if you could weld rock, as soon as work resumed.

Maybe Stanton Coblentz wrote this while he was in high school. I'm sure it had zinc-topped tables.

THE ABOMINABLE EARTHMAN

By Frederik Pohl • Ballantine Books, New York • No. F-685 • 1963 • 159 pp. • 50¢

These seven short stories and novelettes appeared in *Galaxy*, *If* and *Playboy* between 1958 and 1962. They are consequently Pohl-without-Kornbluth and can be used by students desiring to check Kingsley Amis' judgment that Pohl is the greatest SF writer alive and Kornbluth was excess baggage. The expected satiric elements are here, all right, but I don't think this little parcel of evidence will do much otherwise to support the Amis case.

The best *story* in the lot, and the longest, is "Whatever Counts." Being as good as it is, it has been reprinted before. Basically, this is a puzzle story: colonists to a far planet are trapped there by an inhuman race, and how are they to escape? But the solution comes through a well developed interplay of the intricacies of human relations. Human nature also becomes a weapon in the title story, in which one thoroughly obnoxious goof-off is used to drive invading Sirians off the Earth.

You may also have seen "We Never Mention Aunt Nora" before—a Lochinvar romance with an extraterrestrial twist and a wry jab at the end. This is more in the traditional Pohl vein, as is "A Life and a Half," little more than a vignette but sharp and needling. "The Martian Star-Gazers" is a straight-faced essay on xenological astrology. "Punch" is a swift little bite-at-the-end bit, good enough for *Playboy*, and "Three Portraits and a Prayer" is a fairly ordinary plot piece.

When you've used up your backlog of choice pieces, it gets harder and harder to keep good collections coming.

DEATHWORLD 2

By Harry Harrison • Bantam Books, New York • No. F-2838 • 1964 • 151 pp. • 50¢

You may have read the serial version of this entertaining yarn here in Analog as "The Ethical Engineers." The story continues the adventures of the interstellar pragmatist and man-about-space, Jason dinAlt, whom we met in "Deathworld." At that time he was a fugitive from the "justice" of the gamblers whom he had taken over their own jolts. In this story a highly righteous missioner of Absolute Good comes across space to kidnap him from his deathworld haven and see to it that he is executed for his sins against the syndicate (i.e. established order on Cassylia).

But Jason dinAlt has more confidence in his abilities to face a strange world than a familiar kangaroo court, so he soon has the ship down on a nameless world where the descendants of an abandoned colony or castaway crew have gone to hell in their own several and distinctive ways. First encountering a band of root-grubbing slave-holding primitives, Jason and the righteous Mikah work their way to the top of the heap. Rather, Jason fights his way up and drags Mikah with him, struggling and arguing every bit of the way and doing the wrong thing at every opportunity for highly ethical reasons.

Their next hosts have the rudiments of technology; some metal working, petroleum distilling, and steam-wagons bought from urban neighbors. So Jason climbs to a good jumping-off point and leaps again—this time into a technician's birth in a medieval guild-governed society. And still Mikah is arguing and doing what is Right, no matter how wrong it is.

Good fun all the way.

THE PLANET BUYER

By Cordwainer Smith • Pyramid Books, New York • No. R-1084 • 1964 • 156 pp. • 50¢

This is another of those books in which the seasoning is better than the main ingredient. It is the first full-length story "Cordwainer Smith" has set in the world about which he is writing—the world of rat and dragon, of the ships that sail the stars, of the underpeople like C'mell the cat-girl, of the colossal, fantastic structures strewn across the universe by the Daimoni, and of the even more fantastic physical and mental and social evolution of mankind among the star-strewn worlds.

There are no stories like Cordwainer Smith's, and never have been. The intellectuals who adulate Ray Bradbury as a literary stylist should read some of them, though the themes, the ideas, the images are mostly too advanced for an ordinary intellectual to understand. The shorter stories are better than this first long one—it was a serial in *Galaxy* as "The Boy Who Bought Old Earth"—but all of them mesh with it, strengthen it, garnish it, add to its flavor.

Rod McBan, the boy of the title, is a Norstrilian, bound by Norstrilia's cruel, austere customs that ruthlessly root out and destroy non-normals like him. But he has the help of a family computer, and that venerable repository of aberrant probabilities saves Rod's neck by making him, overnight, the richest human being in the universe. Among other things he buys Old Earth, the human homeland, and goes there under extremely hazardous circumstances to observe and enjoy his prize. And the Instrumentalities of the worlds set out to entrap and use and enjoy *him.*

You may be more dazed than enthralled by this book. It's probably too soon to be either, for it is evidently only the first act in the fully Shakespearean history of Rod McBan's effect on mankind and the universe. I guarantee you'll find more in it every time you reread it . . . and some day the whole tapestry will be woven. Not a tapestry—that's too obvious—more a Persian rug, where every knot is essential to the whole. And then, do you suppose there will be someone who can make it into a cycle of operas like Wagner's "Ring"?

THE TWISTED MEN

By A. E. van Vogt

ONE OF OUR ASTEROIDS IS MISSING

By Calvin M. Knox • Ace Books, New York • No. F-263 • 1964 • 130 + 124 pp. • 40¢

A. E. van Vogt's first published short story, "Black Destroyer," appeared here in Astounding in July 1939. It was, and is, a classic, far better in the original than when woven into the book-length "Voyage of the Space Beagle." Ten years later he was selling stories like the three here to *Stirring Science Stories,* and it's a wonder he's allowed them to be resurrected at all.

All three are strictly formula yarns

of the day. "The Twisted Men," originally "Rogue Ship," presents the paradox of a ship that is near Alpha Centauri, traveling at near-light speeds, and plowing through Earth as an irresistible force. It contorts the concepts of relativity beyond recognition. "The Star Saint" offers a van Vogtian superman in Mark Rogan, the title character, who drifts in and out of the action and solves the problem of a hostile world by off-stage action and reasoning. This may be the editor's fault—maybe even the original magazine editor's—because a large chunk seems to have been chopped out of the logic in at least one spot. "The Earth Killers" is the best of the three, with its problem of identifying the enemy which has dropped A-bombs on the principal cities of the U.S. But there are alternative explanations . . .

On the flip side, John Storm, mining engineer, locates a mineral-rich asteroid, files his claim, and comes home to bank his fortune and wed the gal. Only his claim has been erased from the allegedly foolproof files of the computers, and so has he—every trace of him. He goes back to his asteroid to find out the reason for all this, and the action gets physical: it was more fun by far in the earlier stages, and could have made a downright fascinating story if the author had allowed his hero to work out the plot by delving into the intricacies of a computerized society. There are hints of the defensive bureaucracy that such a society would create, but the real story is tossed aside for a Secret Alien and some knuckle-busting.

QUEST OF THE DAWN MAN

By J. H. Rosny • Ace Books, N.Y. • No. F-269 • 1964 • 156 pp. • 40¢

When science fiction was younger and the basic outlines of human evolution less well known, stories which reconstructed the lives of primitive men were rather common. Some writers attempted to be realistic, within the tenets of the anthropology of their day; others let themselves go. This French adventure yarn from the first quarter of the century falls into the latter category.

As Ace Editor Donald Wollheim points out in an introduction, J. H. Rosny was the pen name of a popular French writer and/or writing team: Rosny *aîné*—the elder—and his younger brother. The elder Rosny earned the title of the French Edgar Rice Burroughs for his adventure stories set in a Paleolithic that existed only in his own fertile imagination, embroidering the still vague and sometimes fanciful theories of his day.

This story, better known by its original title, "The Giant Cat," falls somewhere after the beginning of the series. Its heroes are Aoun, son of Urus, evidently a Cro-Magnon hunter, and Zouhr, last of the Neanderthals, whom he has befriended in earlier stories when Aoun's people, the Oulhamr, encountered such hostile folk as the Red Dwarfs, the Blue-Haired Men, and the Men-Devourers. The two find a cave that tunnels under a mountain range—the Alps? the Pyrrenees? the Caucasus? the Himalayas?—and comes out in a warmer land with strange animals and stranger humans. Here they make a new place for themselves, and form a partnership with the gigantic Lion of the Caves.

By present standards and present knowledge, this is as fantastic a hodgepodge as anything Tarzan found in Africa. If Aoun and Zouhr are Cro-Magnon and Neanderthaler, their time must be around thirty thousand years ago . . . yet the fauna they encounter south of the mountains would fit better a hundred thousand years or so before. The races—really species—of humanity they meet derive equally from anthropology and occultism: they include Madame Blavatsky's Lemurians. Axes and bows are as anachronous as some of the animals; typical limestone caves are found in "gneiss" and "basalt"; saber-toothed tigers have four sword-fangs instead of two.

Forty or fifty years ago—the American edition came out in 1924 after forty French editions—nobody could be sure that these things were nonsense, any more than they could be sure that the City of Opar didn't exist in darkest Africa, or Barsoom on Mars. Thus yesterday's science fiction becomes today's fantasy. Read this one as a curio.

THE GODS HATE KANSAS

By Joseph Millard • Monarch Books, Derby, Conn. • No. 414 • 1964 • 126 pp. • 40¢

This is a typical *Startling Stories* yarn, and that is precisely where it originally appeared in November 1941. It was smoothly told, moved fast, had some real menaces and lots of plausible jargon.

A formation of "meteors" crash-land on a Kansas farm. When a scientific crew chip off the enamel with which they're protected—the meteors, that is—invisible intelligences possess them—the people, this time—and proceed to take over the Earth. Part of the program involves a Crimson Plague that sweeps the planet—the corpses are shipped to the Moon to avoid contaminating survivors.

But one man is immune, thanks to a silver plate in his skull, and single-handed he takes on the invaders and whips 'em to a switch ending.

This publisher has pretty poor distribution—though not as poor as some whose books I haven't seen at all in Pittsburgh. I guess it doesn't really matter.

THE MILE-LONG SPACESHIP

By Kate Wilhelm • Berkley Publishing Corp., New York • No. F-862 • 1963 160 pp. • 50¢

One of the eleven short stories and novelettes in this collection—the title story—was first published here in Astounding in 1956. Five of the stories may be new: at least, no prior publication credits are given. The rest have been in other SF magazines between 1958 and 1962. They are all middle-of-the-road stories with surprisingly tight plots and a distinct personal flavor.

"The Mile-Long Spaceship," you may remember, is the one in which a victim of an auto crash finds himself telepathically or clairvoyantly linked with the mile-long spaceship of an alien race, bound across the wastes of Space. But to the crew of the ship—and to the reader—*he* is the alien spy.

"Fear Is a Cold Black" is a kind of puzzle story in which the this-time human crew of another spaceship find themselves dying one-by-one, their temperatures falling steadily until they die. The ship's captain must find a way out—and does.

"Jenny With Wings" is a believable little romance whose theme and plot are rolled up in the title. Jenny was born with wings. Flying is her life. But now she is in love with a normal man. . .

"A Is for Automation" is another tangy character sketch, in which an obsolete old watchman craftily feuds with the electronic brain—and personality—that has been given charge of a fully automated factory.

"Gift From the Stars" is perhaps the least of the eleven. A tycoon tries to crush a helpless old shopkeeper who is actually custodian of an extraterrestrial observation post.

"No Light in the Window" is pure woman's magazine stuff with a solid core of sound psychology. A girl fears that she will not qualify for the crew of a starship, and that she will be left behind when her young husband goes into Space. Two weeks on jury duty last spring have cured me of sneering at soap operas: our intellectuals to the contrary, ordinary people do live and act and think that way!

"One for the Road" is a brief episode in a revolt of the populace against scientists. The solution is too pat.

"Andover and the Android" is not the story the cover-blurb writer thought it ought to be. Roger Andover "married" an android because he was fed up with real women, but he didn't fall in love with her. Her repairman died.

"The Man Without a Planet" is one you have probably seen before in an anthology: sorry I can't recall which one. It projects the Victorian classic into the future, toughens it, and ends with a sentimental twist.

"The Apostolic Travelers" you may consider fantasy, depending on your religious convictions. Two chosen members of a planetary theocracy are given immortality through the faster-than-light drive.

Finally, "The Last Days of the Captain" is another vignette of human character. A planet is to be attacked and destroyed, and Captain Winters must evacuate the human colonists secretly. But one woman is stubborn.

Kate Wilhelm should be reprinted more often.

ESCAPE ACROSS THE COSMOS

By Gardner Fox • Paperback Library, New York • No. 52-273 • 1964 • 160 pp. • 50¢

This is a typical superman yarn which would be pleasant enough if it weren't marred by the most ungodly collection of "scientific" double-talk that has come this way in years.

Kael Carrick is an ex-basket-case who has been repaired and converted into a silicon superman by Earth's greatest scientist. He has then been framed for the man's murder and exiled to a desert planet without food or water. Rescued by fellow convicts, he returns to exonerate himself and is soon deep in a fight to exploit another Earth in a parallel dimension, where his super-powers will be needed to combat an evil "god" from the distant past. In fact, he has been constructed for that very purpose.

Familiar? Sure it is. But the action flows quite well when the author isn't throwing in his ridiculous jargon. This kind of thing, when done by a writer with some knowledge of science, can sound right even though it's nonsense. In Dr. E. E. Smith's "Skylark of Space" he doubletalked his readers into believing he was revealing the innermost secrets of atomic physics—what I called a superlative "snow job" at the Washington convention. That present ideas of nuclear physics are quite different doesn't alter the fact that "Doc" Smith's made-up physics *sounded* right. This author's sounds ridiculous.

On the tangible side, the "different vibration" concept was stale enough and without foundation when I used it in my own first story in 1930, but there is really no excuse for it now. Anyone with some high school chemistry should know that even if he invents a new trans-Lawrencium element with remarkable properties (and high school chemistry also predicts any such elements will have remarkably short half-lives), he can't give it a symbol—Sb—which is already in use for antimony. And if the author doesn't know the difference between "copywriting," "copyrighting" and patenting, the editor should.

No go.

REPRINT ROUNDUP

THE NAKED SUN

By Isaac Asimov • Lancer Books, New York • No. 72-753 • 1964 • 191 pp. • 50¢

One of the real classics, serialized here in 1956. Like the preceding "Caves of Steel," this is a formal detective story of the far future, with a team composed of human and robot detectives Elijah Bailey and R. Daniel Olivaw.

THE SEEDLING STARS

By James Blish • Signet Books, New York • No. D-2549 • 158 pp • 50¢

A reissue, with new cover, of the 1959 edition. These are the stories of the Adapted Men, which appeared in various magazines between 1942 and 1955. Since Mankind finds so many planets uninhabitable, men are bred to live on them.

13 GREAT STORIES OF SCIENCE FICTION

Edited by Groff Conklin • Gold Medal Books, New York • No. d-1444 • 192 pp. • 50¢

Reissues of the paperback editions of three prime anthologies.

BRASS TACKS

(continued from page 4)

Anyhow the story was very much enjoyed and none of what I have said is intended as criticism.

I have wanted to write to you, John, several times to compliment you on your very good and thought provoking editorials and have finally gotten around to it. The 5/ I pay for your magazine is in my consideration worth it for just the editorial and I accept the stories as just a bonus. For a while I hadn't been enjoying the stories very much but the last two issues have been very much in my personal taste by having moving action in it. ("Sleeping Planet" is a terrific yarn, in case I'm in time for Analytical Laboratory I want to vote him 1° for both July and August).

Well I'm very interested to see if any of your other readers have any comments to make about "WHAT IS *OUR* REAL ENEMY?"

Ed. van. der. Straten
91 Mardon Rd.
Hamilton, New Zealand.

Maybe "our real enemy" is simply the laws of logic and probability as related to survival. Teddy Roosevelt put it "Speak softly, but carry a big stick." The essence of the problem is that, in meeting a complete unknown, it is logically essential to be prepared to meet the attack of a completely vicious man-eater; that way you have a maximum chance of surviving if the unknown does turn out to be a deadly destroyer. And that way you can live long enough to investigate and determine that the Unknown is not a vicious destroyer, but reasonable and friendly —which you wouldn't if you weren't, in all meetings, ready for anything!

Elsa, the lioness of "Born Free" and "Living Free," was gentle, friendly, and trustworthy. Knowing this, how will you greet the next lioness you meet on the African veldt?

That simple logic-and-probability problem accounts for the most annoying of race-relation problems. Meeting a stranger, I MUST react on the basis of statistics of his race, not on the basis of what-he-is, since that I do not yet know.

Elsa was friendly—but I'll still meet all lionesses with a gun!

Dear Mr. Campbell:

I enjoyed "Sweet Dreams, Sweet Princes" immensely. I would like to suggest that Mr. Reynolds study his Karate a little more before using it so freely in his stories. With so many Karate-ka (Karate students) these days, his more obvious errors will be picked up pretty quickly.

For example:

1. No Karate-ka can strike a man and thereupon pronounce that he will be unconscious for fifteen minutes. It's just not that exact an art since a blow of the same strength might knock out one individual for 5 minutes, another for 20 minutes and (rarely) kill someone else. You can, however, choose between blows that are rarely fatal and others that are almost always fatal.

2. The Kiba-dachi stance is the "fighting" stance. A stance such as Zen-kutsu-dachi is the "power" stance and is used to deliver an effective blow when your opponent presents an opening—never at the beginning of a fight. Mr. Reynolds has obviously "boned up" on the various stances, he just doesn't know when to use them.

3. How did Denny become a fifth Dan black belt if there are only three Black Belts in the Western World. Granted he may have studied elsewhere. But it takes five to ten years to achieve fifth Dan—if ever—and a degree can only be given by a teacher with a higher rank. Who on earth could his teacher have been?

Never mind. I was up till 4:00 a.m. last night reading the story and enjoyed every minute of it.

Dr. N. Paige, Shodan
Vice President,
National Karate Assoc.
Toronto 1, Canada

They must have changed the rules in the intervening centuries!

Dear John,

In Hank Dempsey's story, "A Matter of Timing," January, 1965 issue of Analog, he describes a foundation which supports crackpot research. Perhaps I don't qualify as a crackpot, but I certainly qualify as having failed, among other things, to get any portion of the 1.2 billions of dollars currently being spent annually for medical research. Perhaps Analog readers would be interested in some of my experiences.

Medical statistics is my field of specialization. My Ph.D. was granted by the University of Michigan, and I have been working in the field for about fifteen years. I have not counted my publications recently, but it is somewhere between twenty and thirty, including a textbook for medical students. Seven years ago, I came to Florida at the request of the University to occupy a position in the then new medical school complex. Administratively, I reported to the Provost of the Health Center, the administrative equivalent of a Vice President for Medical Affairs.

The problem of medically "normal values" has always interested me, partly because of its importance and partly because there is so little about it in the medical literature. About two years ago, it occurred to me that good "normal value" information could be obtained from existing medical measurements, which, of course, are mixtures of measurements of sick as well as healthy persons. With some relatively simple mathematical techniques, it was thought to be possible to separate out those measurements which represented the equivalent of testing healthy persons.

Preliminary studies indicated that the method was worth further study and an application for support by the National Institutes of Health was prepared. By the time the application was processed, sufficient material had been accumulated so that two papers had been written and accepted for publication in medical journals. The N.I.H. committee appointed to review the application visited me in Florida to go over details of the proposal. There were two statisticians on the reviewing committee.

Now from the statistical point of view, the problem is that of dissecting one component from a set of mixed distributions. Before I submitted the application to N.I.H., I learned that a group of California mathematicians —who have received about 6 millions of dollars of N.I.H. money—were working on the mathematical problem. In my own application, I stated that results of the California work would be used, so there was no provision for mathematical work. I thought any misunderstandings about the proposal were cleared up with the visit by the Committee, so it was quite a surprise when the grant request was turned down. I had not shown, according to the comments of the reviewing committee, how the mathematical problem would be solved. This put N.I.H. in a peculiar position in two ways: First, it disapproved research in mathematics which it was already supporting, and second, it supported research in pure mathematics while it denied support to a medical application of the same mathematics. This is some position for a Health Agency!

I had previously corresponded with Dr. Shannon, Director of the National Institutes of Health, about the normal value problem, so I knew he was interested in it. Because of the way my application had been handled, I was not very interested in submitting a second application, but I did write to Dr. Shannon about the matter. To my pleasant surprise, he investigated and suggested that I submit a second application. This was a year ago last spring. By this time, the two papers had been published, and requests for copies of them were literally pouring in. So a year ago last spring, I started preparation of a second research grant application.

Several months prior to this, my administrative superior, the Health Center Provost, had resigned and a new man had taken his place. The new man was formerly Head of the Department of Medicine in the College of Medicine and was thus jumped over the Dean of the Medical School. Conflict developed immediately between these two men, and the Dean recently resigned to the tune of a public attack on the Administration of the University of Florida. This should provide an idea of the calm, scholarly atmosphere in which I found myself at that time.

Not long before I was ready to submit my second research grant application, the new Provost said to me one day, "No one seems to be interested in what you are doing, so I am considering abolishing your position which would result in your being dismissed from the University." I protested, saying that an investigation of my function should be made before making any change, or at least I should have the opportunity of discussing the matter with those who claimed that the function was of so little value. Two or three weeks later, ignoring my pleas, he handed me a letter abolishing my position and terminating my employment with the University to be effective at the end of the academic year. I had simply been fired, and thus became the first person in the history of education to have been fired by means of the ruse of abolishing his position. He who gets no research grants is in a very weak position in a University. I decided to protest my firing through legal channels, but that is another story that is far from over.

So my second research grant application had to be submitted as a private citizen. By this time, my politically naïve scientist's mind began to realize that there is more to the problem of obtaining a research grant and keeping employed in a University than the merit of one's research and teaching. I started to look around a bit. Through the pages of *Science*, official publication of the American Association for the Advancement of Science, I learned that Representative Fountain had an interest in N.I.H., so I tried contacting him. I got quite a sympathetic reception from a member of his staff, but that was all. I was also naïve enough to think that I was the victim of somewhat unwieldy N.I.H. reviewing procedures, so I thought that all that was needed was to show how the procedures could be improved; then we would all be one big, happy family, with the allocation of research funds based on the genuine worth of the proposals.

In a letter to *Science*, with a copy to Representative Fountain, I suggested that the N.I.H. grant review program be revised so that if the applicant's request was turned down, and he so desired, he could argue the merits of his proposal *in public* before an appeal committee. In other words, provisions would be made for appeal somewhat along the lines of those in our judiciary system.

Science never published the letter, Representative Fountain ignored it, and my second research grant application was turned down.

Again I dutifully reported the matter to Dr. Shannon, and again he made an investigation. By now sort of a routine had been established. He suggested that a third application be prepared. Again I informed Representative Fountain and was assured by a member of his staff that "Eminent Scientists" reviewed the grant applications. One of the statisticians on the first reviewing committee had received his Ph.D. only two years previously. This fellow really became eminent in a hurry. In order to get an idea of what was really going on, I tried a long shot and telephoned N.I.H. I was fortunate in contacting a person who was willing to talk and who quickly reviewed the Committee's report. I was flatly told that this was a political turndown.

Another person I contacted in my looking around Washington, was Senator Humphrey. As a result of my discussions with his staff, I was invited to submit a proposal for a group of Drug Information and Evaluation Centers. The proposal was published in Part 4, Subcommittee on Reorganization and International Organizations of the Committee on Government Operations, United States Senate. (Honest, that is what it says on jacket of this volume). The proposal has been greeted by the deadest silence which I have ever encountered. Perhaps the good Senator will have more time for such matters when he becomes Vice President. But back to my

are you

SURE?

ARE YOU SAFE
AND SECURE?
WHEN THEY START TO
EMBALM YOU, ARE YOU
TICKLISH? CAN YOU
REALLY ☆*LISTEN?*☆
DO YOU LIKE DUCK SOUP
WITH A DASH OF COCOANUTS?
NO, *NO*, YES, Yes, *YES* -- IF THESE ARE YOUR ANSWERS, YOU MAY ENJOY THE NON-MUSICAL COMEDY OF DAWSON & HARRELL, STARRING:

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BRASS TACKS

story about the search for research funds.

As a result of my experiences with N.I.H. I decided to try the big, private foundations, such as Rockefeller, Ford, Commonwealth, Kellogg, etcetera. It was a waste of time. These people do not support work in medical research so I tried a few smaller "special interest" foundations. I found very quickly that the nice old ladies with whom I usually found myself talking—most of this was done by telephone—did not have the slightest idea of what I was trying to tell them. So there was not even any hope of obtaining support from private foundations.

With understandable reluctance, I finally decided to prepare a third grant application. Other than N.I.H., there was no place to go. In the meantime, two additional papers had been written, and evidence continued to mount that the methods were sound. I had supplied the money to support the work out of my own pocket. So by the time the third application was submitted, I was really loaded with evidence that the proposal was worthwhile.

After the third application had been submitted, I was pleasantly surprised to receive a letter from an N.I.H. staff man who had gone over the application and was attempting to clear up any misunderstandings that might be encountered by the reviewing committee when they evaluated it. The committee did not visit me for the second and third applications. It looked as though N.I.H. was really trying to be fair this time. But the reviewing committee must have been playing "one-upsmanship" with me, because the third grant request was turned down, too.

In the meantime, work has continued financed from my own pocket. Six papers have either been published or are awaiting publication after being accepted by the editors of the medical journals, and I have just signed a contract for writing a book about the methods and the information they yield.

So in spite of being dismissed from the University of Florida; in spite of heavy legal expenses for my case against the University; in spite of having to support work of importance to the medical profession from my own pocket, it is being done. My wife, who is a pathologist, and I feel that it is much too important for it to be discontinued because of the National Institutes of Health and a few officials of the University of Florida. We have every reason to believe that it will be of value to the entire medical profession when it is understood and used properly. All together, requests for copies of the articles published so far are in the neighborhood of 1,200, and we know of at least two articles which independently confirm the value of our methods.

There is one small addendum to my story about the first research grant request and the California mathematicians. I never did receive word that their research was successful. I had to develop my own methods.

So if the foundation described in the story exists somewhere, do you suppose I could qualify as an applicant?

Robert G. Hoffmann, Ph.D.
Private, Army of the Unemployed
1726 N. W. 10th Terrace
Gainesville, Florida

Welll . . . you can make an application to the Foundation, on their Form 1040AXE, but I'm afraid you wouldn't qualify. Your suggestions really aren't crackpot enough to warrant their support. A proposal such as yours, which makes logical good sense, should be taken to some established Foundation.

Have you tried going to the Russian Embassy? The Russians are deeply interested in mathematics and in new research techniques. And their bureaucracies don't seem to be quite as politically motivated as ours are getting to be.

And, too, you might consider the phenomena revealed in Dr. Sipes story "Final Report" in that same January issue. Is your idea really popular and pleasing to the review committee?

Dear Mr. Campbell:

H. Beam Piper was found dead in his apartment on November 9th. He committed suicide. The obituary appeared in the New York *Times* and *Variety*—but both newspapers afforded it only one paragraph of space, while *Variety* stated inaccurately that he died at Altoona.

I am a reporter for *Grit*, a weekly newspaper published at Williamsport and distributed in three editions throughout the area, state, and nation. In the November 15th city edition, the full story of Mr. Piper's death appeared. I wrote this obituary.

Since Mr. Piper was closely connected with Analog magazine and its earlier incarnation, Astounding, I thought your readers would want to know more fully the story of Mr. Piper's death.

Burial took place Thursday, November 12th, in Fairview Cemetery. Mr.

Piper was sixty. Police discovered his body early Monday morning of the 9th. He had shot himself to death in his apartment at 330 East Third Street, Williamsport, sometime over the weekend.

Captain Lawrence P. Smeak, investigating officer for the Williamsport Police Department, said the author used a .38-caliber pistol which was part of a valuable collection of more than one hundred weapons which Mr. Piper owned.

There was a suicide note, but it did not give reasons for the fatal decision. However, it ended with a grim joke such as one might expect from a man who made his living from words: "I don't like to leave messes when I go away, but if I could have cleaned up any of this mess, I wouldn't be going away. H. Beam Piper."

It is fitting, perhaps, that Analog should print the very last words which Mr. Piper wrote, since Astounding printed his very first story, "Time and Time Again," in 1947.

Captain Smeak said there is evidence that financial difficulty may have been the major cause for the suicide. The estate is being settled and may be taken over by distant relatives, since he left no immediate survivors.

A native of Altoona, Mr. Piper was formerly a policeman for the Pennsylvania Railroad at Altoona. He began selling science fiction and mystery fiction in the late '40s and quit his railroad job to become a full-time free lance in 1956. He moved first to New York City, then to Paris. In 1957, he came back to the United States.

He had several friends in Williamsport at that time and his gun collection (which had been loaned to the Lycoming Historical Society Museum) was in the city, so he settled here.

I met him once myself about a year ago. He was my first guest. My wife and I had just set up housekeeping when I learned that Forry Ackerman was about to make his much-publicized trip to the east coast scifi-con. I invited Ackerman to stop at our house—meaning to get an interview with him—and he accepted. Dick Frank, whose name should be well-known to s-f fans (if for no other reason, for discovering A. Merritt's "Three Lines of Old French," bless him!), who also works in the *Grit* editorial department, came along and brought Mike Knerr and Mr. Piper.

Well, the weather was bad and Ackerman never did show up, but we had an engaging hour or so gabbing. At first reticent, even shy, Mr. Piper warmed to the conversation quickly once he felt at ease. He proved a charming, gracious man, soft-spoken and witty, perceptive in his comments.

At one point he said he'd like to see a local science-fiction society formed, but that's as far as it went. In the months to come, my wife and I wanted to invite him to dinner but were frankly intimidated at the thought of disturbing him. An internationally famous writer, you know...

Now we realize we should have taken the initiative and asked him, but hindsight will always show the clear path that was formerly covered over. Personally, I suspect that loneliness may have been as important a factor in the final tragedy as any other consideration.

You know, in an odd way, his writing came full circle—his first story, published in Astounding, as I said before, was set in Williamsport. His last story to be printed during his lifetime—"Gunpowder God," in the November Analog—also was set in the Lycoming County vicinity. Both tales were time-travel yarns of a sort, each involved with an alternate time-track theory, to greater or lesser degree.

His novels and short stories, which include such delights as "Little Fuzzy," "The Other Human Race," "Space Viking," "Junkyard Planet," "Four-Day Planet"—and, ironically, "Murder in the Gun Room"—appeared in magazines, hardcover, softcover, and TV adaptation in the United States, Germany, Great Britain, Italy, and France. He also was anthologized several times.

His main hobby pursuits were weaponry—he was an expert marksman—and Fifteenth Century Italian lore. He belonged to the National Rifle Association and the Williamsport Writers Forum. And somewhere I read that his favorite dessert was vanilla ice cream covered with Creme de Cacao. (I heartily recommend it.) Perhaps we can name it after him, as a sort of s-f fan tribute? Any suggestions? How about a Fuzzy Frappe?

His only survivors are cousins in Altoona, Camp Hill—near Harrisburg—and in Virginia.

The shock felt when I first heard about the tragedy has gone. But although I met him only once, I doubt that I will ever lose the vivid recollection of his warm, gentle manner.

Perhaps the one consolation his fans can have is that he retained his full writing powers even to the end.

MARVIN N. KATZ

Grit Publishing Company
Williamsport, Pa.

Beam had one more story of the adventure of Lord Kalvan nearly finished when he died. The mystery is not how he died, but why. . . ?

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TIME FOR AMERICA

continued from page 7

is going back to the more economical digest size we started with.

In the digest size, Analog is a reader-supported magazine—it's your four bits on the counters all over the country — and the world — that pays for paper, ink, authors, editing, and everything else that it takes to make a magazine.

The larger size—this issue's size—is too expensive to be reader-supported; to be successful, it also must be advertiser supported.

It wasn't.

When I started in this science-fiction business, some thirty-five years ago, the stories were usually called, by non-readers, "pseudo-science fantasies" and things considerably more derogatory. "Nonsense" was the usual reaction of the professors and the teachers.

It took some twenty years before the success of the Manhattan Project and the rocketship began to get it through the general consciousness that science fiction was neither fantasy nor pseudo science.

The trouble is, there have been two reactions in the public mind. One is the "Take it away! It's horrible!" reaction produced by the discovery that nuclear energy was *not* a "silly pseudo-science fantasy," but a reality to live and work with. And that discussion of life on other worlds—worlds out there in space *which actually was accessible to intelligent beings*, was frighteningly real, serious, and necessary.

The other type reaction is that which led to TV and movies happily jumping on the new bandwagon . . . and missing the point completely.

They are working on that public fear of a world larger than the general citizen wants to think about—a world in which atomic power and atomic weapons are real, and the possibility of contacting entities from other planets is real. If you hoke it up enough, make all the aliens either laughable fools, or impossibly inhuman and weird, you can retain your conviction that it's really not very important.

One of the best ways to stabilize a child who's turned up afraid of the Bogeyman is a very simple psychological trick. Get the child to take his crayons and draw a picture of the Bogeyman "so I'll know what he looks like." A few suggestions that he'd look worse with orange ears, and maybe if he had a purple goatee . . . and the child is happily manipulating the picture himself. It is no longer a threat to him, because he is controlling and building it.

Works fine. For Bogeymen.

That, in essence, is the background psychological motivation for the acceptance of the Bug-Eyed Monster movies, and the ridiculous TV science fiction.

The general, nontechnical mind does not want the essential themes of science fiction to be believable—because the unbelievable naturally *feels* untrue. Emotionally, making something *feel* untrue is both necessary and sufficient; making it really untrue is neither necessary nor sufficient.

Unfortunately, as of now most management-level people are not merely non-science-fiction readers, they have a strong emotional reaction against the themes science fiction necessarily portrays. Those who are themselves honestly neutral on the subject are influenced by the most widely evident form of "science fiction"—movies and TV—to consider the stuff of no interest whatever to any thoughtful person.

Their unfortunately near unanimous conclusion is that a science-fiction magazine is not a suitable place for serious technical advertising.

Relatively few companies have had the understanding and vision—usually because the executives involved were science-fiction readers themselves—to recognize the real potential of the highly unusual audience Analog has.

That, by the way, was another source of our troubles! We had a heck of a time getting advertising people to believe we weren't lying in our statistical teeth; the educational level, income level, all the other standard indexes of a quality market were—unfortunately literally — unbelievably high. Nobody reads Analog out of a sense of professional duty—saving the 0.05% or so of professional science-fiction writers! Nobody reads Analog to convince his boss he's really hep and on the ball. Our captive audience is very close to zero.

They wouldn't believe we really had an audience of the quality we do.

So . . . for those various reasons, reasons that a hard, all-out try for two years simply established, and was unable to move, we're going back to a reader-supported magazine.

That means, simply, that while we will, of course, have advertising—extra income is always helpful!—it will be, in essence, the four bits you lay down on the counter that pays for the manuscripts, the paper, printing, and editorial work that goes into it. We earnestly hope we'll have ads—they're obviously of advantage economically in determining what extras we can afford in the way of paper quality, pages, etcetera. But we will not be investing so heavily in advertising solicitation. We tried it; the time isn't ripe.

Incidentally, it was a real, solid, fully-backed try. Condé Nast put the full resources of a great publishing organization, and top-notch advertising experts to work on the job. If you're going to perform an experiment in an effort to determine facts—*make* the experiment! *Really* try the job! Condé Nast did, I can assure you.

The decision to discontinue the experiment comes at a highly inconvenient time; I am aware that you have reason to howl at the very bad timing. The first of the digest issues will be the April issue—which is issue No. 2 of Vol. LXXV, not No. 1. Moreover, Frank Herbert's great novel, "Prophet of Dune"—which has to run five parts, because of the great length, equivalent to two standard 60,000 worders—will be split into three large-size installments and two digest-size installments.

The reason for such seemingly

thoughtless changing from horse to pony in midstream has to do with the economics of the paper industry, and our own paper inventory. The paper contract for Analog was up for renewal when it was up for renewal—not when it would be convenient to our change-over.

So the change comes, most inconveniently, in the middle of a volume, and the middle of a serial. My apologies.

Fortunately, Herbert's "Prophet of Dune" will be available in hard-cover book shortly after we finish its publication here, so the novel-savers will have an alternative source almost immediately.

In going back to the digest size, some changes will be made in the technology of production. Some details on that are still being worked on, as of the moment of writing this. Basically —look for the digest size issue next month, and see what we've got.

It will be printed on a new type of paper, akin to the non-coated stock in this issue, one of the family of "Antique" papers, but a white stock instead of the ivory tinted material this issue uses. And it's supposed to have the characteristic that, unlike the old pulp paper, it can endure to become a genuine antique! The paper manufacturer says it's time-resistant to a high degree.

It will be printed by the offset process. Heretofore Astounding-Analog has always been printed by the letterpress technique, which is essentially the method developed by Herr Gutenberg some centuries ago, involving pressing ink-smeared, hard-faced type directly against the paper. The contraption used for pressing the aforesaid hard-faced type against the paper has changed notably, but the basic idea hasn't.

Offset technique is different; the hard-faced type never touches the paper; instead, the inked type is pressed against a soft rubber "blanket," which is subsequently pressed against the paper, transferring the inked image to the paper.

It's a newer technique, and has some distinct advantages; for one thing, because the type-image is transferred by a soft material, the precision of point-to-point contact achieved is markedly greater. It will, for one thing, allow us to print sharply detailed photographs anywhere in the magazine, instead of on only a few pages.

That image transfer system, using the soft rubber blanket, is basically the one that solved the problem of printing a trade-mark sign on the roughly corrugated shell of a walnut. Any technique that can print a legible label on a surface as improbable as a walnut shell really has remarkable competence! Try it with a hard-faced type, sometime.

The magazine will have 164 pages, and will continue to sell at the present price.

Astounding-Analog was a successful reader-supported magazine for over thirty years; Condé Nast did not make the try for an advertising supported magazine out of necessity, but because that seemed the proper direction of growth of a successful and active medium—science-fiction.

Unfortunately, it wasn't "time for America"; we're going back to the successful "colony"—our "Iceland." If we can continue as a reader-supported "colony" as long as Iceland has, we'll be having problems of distribution on the intergalactic mail liners.

A number of readers feared, when we changed to the large size, that there'd be a change of editorial policy. There wasn't.

We're changing size again. There won't be a change of policy. Analog was, is, and will be reader-supported in one fundamental sense—if the readers don't like a magazine, that magazine gets an invitation to "Drop dead!" from readers, advertisers, and business management. Advertisers don't advertise in magazines readers won't buy; that's why we didn't make any effort whatever to change the editorial policy during the last two years.

We're certainly not going to change the policy now.

We'll continue to have one article a month on science—preferably aspects on the frontiers of science that don't ordinarily get adequate coverage in general technical or popular-technical magazines. Or on phases of science that anyone ten years out of college knows perfectly well is stark nonsense . . . unless it's in his own field of work, where he's kept up with the reversal of things we knew-for-sure. Like only a few years ago we knew-for-sure that the inert gases *couldn't* form compounds. (Sodium perxenate, $NaXeO_4$, is the most powerful water-solution oxidizing agent available, in some conditions. Very handy, because its degradation product doesn't interfere with the action. And you don't need boilers, turbines, et cetera, to turn heat into electricity; just blow the flame through a magnet and collect the kilowatts. And of *course* the Moon doesn't influence the weather; that's a well established scientific myth!)

A little further back, when I was studying astrophysics during the '30s, it was known-for-sure that a star could burn hydrogen to helium, but when the hydrogen supply was used up, it no longer had any possible source of energy, and had to collapse and go dark.

So now they get hotter and start burning helium to make elements up to iron-56. Probably a few years more, and we'll discover that there are energy-releasing actions that we now know-for-sure are impossible.

Analog's business will be bringing you the frontier-speculation articles that indicate which way things are trending in science, and the reporting articles on breakthroughs when they do come.

Editorially, I shall continue to try to investigate the nature of the stuffing in any suspiciously bulging shirts around. My business is directly concerned with the progress and achievement of the human race; any orthodoxy that tends to sidetrack or otherwise impede progress is interfering with my business, and I'll do what I can to sabotage them.

Mostly, though, Analog is dedicated to the proposition that, far from being frightening, the exploration of the future, and the Universe is, and of a right ought to be, great fun!

The Editor.

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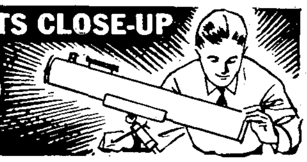

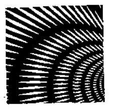

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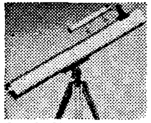

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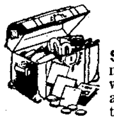

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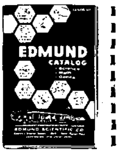

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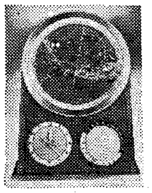

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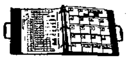

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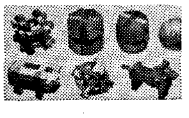
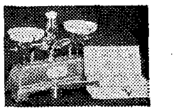
Fascinating new hobby—collect the 103 known elements. New Kit provides hours of fun, helps you quickly learn all basic scientific facts. Most elements easily obtained in pure or compound form. Contains all materials needed for attractive, instructive display; rugged simulated black leather 3-ring binder with slide-away plastic handles; 5 heavy clear vinyl insert sheets, each with 20 (2" x 2") specimen pockets; 5 insert identification cards for 100 elements; 63-page book. "Atoms, Crystals, Molecules," by A. H. Drummond, Jr., gives periodic table of elements, classroom intro. to atomic structure and chemical bonding.
STOCK NO. 70,720-A, Complete kit .... $7.50 Ppd.
STOCK NO. 70-721-A, Binder with handles only. $2.50 Ppd.
STOCK NO. 70,722-A, Three 20-pocket Inserts only .... $1.00 Ppd.

WOODEN SOLID PUZZLES



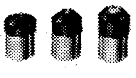
12 Different puzzles that will stimulate your ability to think and reason. Here is a fasci*nating assortment of wood* puzzles that will provide hours of pleasure. Twelve different puzzles, animals and geometric forms to take apart and reassemble, give a chance for all the family, young and old, to test skill, patience and, best of all, to stimulate ability to think and reason while having lots of fun. Order yours now.
Stock No. 70,205-A .... $3.00 Postpaid



LOW COST
PRECISE LAB BALANCE

Built for hard, daily use. Weighs materials from 100 miligrams to 100 grams, can be used for pro*portionate measuring.* Has removable plastic pans 60mm in dia. Features base of rugged cast iron and adjustable one piece beam for balancing. Overall ht. 5½" x 7" long. Comes complete with set of 12 weights ranging from 100 mg to 50 g and pr. of tweezers in wooden box. Imported.
Stock No. 70,443-A .... $15.00 Postpaid

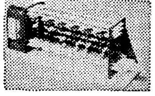
NEW KELLNER STANDARD 1¼" EYEPIECES



Wide, flat fields, excellent color correction, coated lenses. All have standards 1½" outside diam., 50-degree apparent field of view. Ample eye relief. Attractive chrome and black finish, easily visible markings.

Stock No.	Eye Piece	Focal Length	Eye Lens Diam.	Field Lens Diam.	Price Ppd.
60,492-A	(A)	9mm	5mm	7.5mm	$9.75
60-493-A	(B)	12mm	7mm	8mm	9.25
60,494-A	(C)	18mm	15mm	19mm	9.00

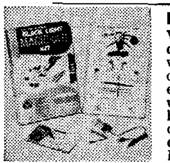
Solve Problems! Tell Fortunes! Play Games!



NEW WORKING MODEL DIGITAL COMPUTER

ACTUAL MINIATURE VERSION OF GIANT ELECTRONIC BRAINS

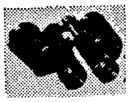
Fascinating new see-through model computer actually solves problems, *teaches computer fundamentals.* Adds, subtracts, multiplies, shifts, complements, carries, memorizes, counts, compares, sequences. Attractively colored, rigid plastic parts easily assembled, 12" x 3½" x 4¾". Incl. step-by-step assembly diagrams, 32-page instruction book covering operation, computer language (binary system), programming, problems and 15 experiments.
Stock No. 70,683-A .... $5.00 Ppd.



BLACK LIGHT MAGIC-GLOW KIT

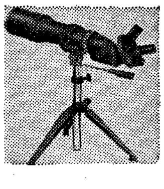
With this Kit, you can collect fluorescent rocks, paint with living light, write secret messages, learn invisible detection methods, even make a fluorescent Christmas tree! Kit uses longwave blacklight, which is completely harmless to eyes, but causes fluorescence in over 3,000 substances. Includes Magic Glow Lamp, universal laboratory lamp stand, *invisible water* paints and ink, fluorescent crayon, tracer powder, pen, 3 brushes, specimens of fluorescent rocks: wernerite from Canada, fluorite from England, willemite from U.S.A. **Plus book of 40 experiments.**
Stock No. 70.256-A .... $11.95 postpaid

6 x 30 WAR SURPLUS AMERICAN-MADE BINOCULARS



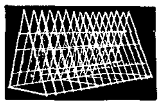
Big savings—brand new. Crystal clear viewing—6 power. Optics fully coated. Individual focus. Exit pupil 5 mm. Approx. field—445 ft. at 1000 yds. Excellent for spectator sports, races, hunting, etc. Normally costs $100 up. Complete with carrying case and strap.
Stock No. 963-A .... $33.00 Ppd.
7x35 American Made Binoculars
Stock No. 964-A .... $60.50 Ppd. (tax incl.)
7x50 Binoculars—Terrific Buy!
Stock No. 1544-A .... $74.80 Ppd. (tax incl.)

DELUXE SPOTTING SCOPE WITH REVOLVING TURRET



Spots large or small game at great distances. Shows target holes in sharp detail. 15X, 20X, 30X, 40X. Four eyepieces revolve on turret at flick of finger. Quick adjustment to each. Excellent 80 mm coated achromatic objective lens Incl. "Dew-cap"; extendable sunshade; tripod with sturdy metal legs adjusts from 9" to 14"; chrome plated 9" ext. rod. Folds for carrying. Wgt. 4 lbs. 4 *ozs.*
Stock No. 70,444-A .... $69.50 Postpaid

D-STIX CONSTRUCTION KITS

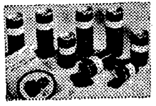


D-Stix clarify geometric figures for the young by actually demonstrating them in three dimensions. They make recognition and understanding fun. They can also be used for showing molecular structures in science classes, concepts of elementary science and physics. These modern construction *kits are far superior to older style* wood or metal construction kits.

220 pieces, 5, 6 and 8 sleeve connectors. 2", 3", 4", 5", 6" and 8" colored D-Stix—
Stock No. 70,209-A .... $3.00 Postpaid

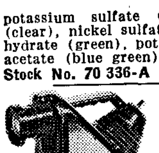
370 pieces, incl. 5, 6 and 8 sleeve connectors. 2", 3", 4", *5", 6", 8", 10" and 12" D-Stix in colors*—
Stock No. 70,210-A .... $5.00 Postpaid

452 pieces, includes all items in 70,210 above plus long unpainted D-Stix for use in making your own designs—
Stock No. 70,211-A .... $7.00 Postpaid



CRYSTAL GROWING KIT

Do a crystallography project illustrated with large beautiful crystals you grow yourself. Kit includes the book "Crystals and Crystal Growing" and a generous supply of the chemicals you need to grow large display crystals of potassium aluminum sulfate (clear), potassium sulfate (purple), potassium sodium tartrate (clear), nickel sulfate hexahydrate (blue green) or heptahydrate (green), potassium ferricyanide (red), and copper acetate (blue green).
Stock No. 70 336-A .... $9.50 Postpaid



Terrific Buy! American Made!
OPAQUE PROJECTOR

Projects illustrations up to 3" x 3½" and *enlarges them to 35" x 30"* if screen is 6½ ft. from projector; larger pictures if screen is further away. No film or negatives needed. Projects charts, diagrams, pictures, photos, lettering in full color or black-and-white. Operates on 115 volt, A.C. current, 6-ft. extension cord and plug included. Operates on 60 watt bulb, not included. Size 12" x 8" x 4½" wide. Weight 1 lb., 2 oz. Plastic case with built-in handle.
Stock No. 70,199-A .... $7.95 Postpaid

FASCINATING NEW KALEIDOSCOPE INSERT. Same *unit as above, but provides endless additional projects with* everchanging kaleidoscope patterns.
Stock No. 70,714-A .... $10.00 Postpaid

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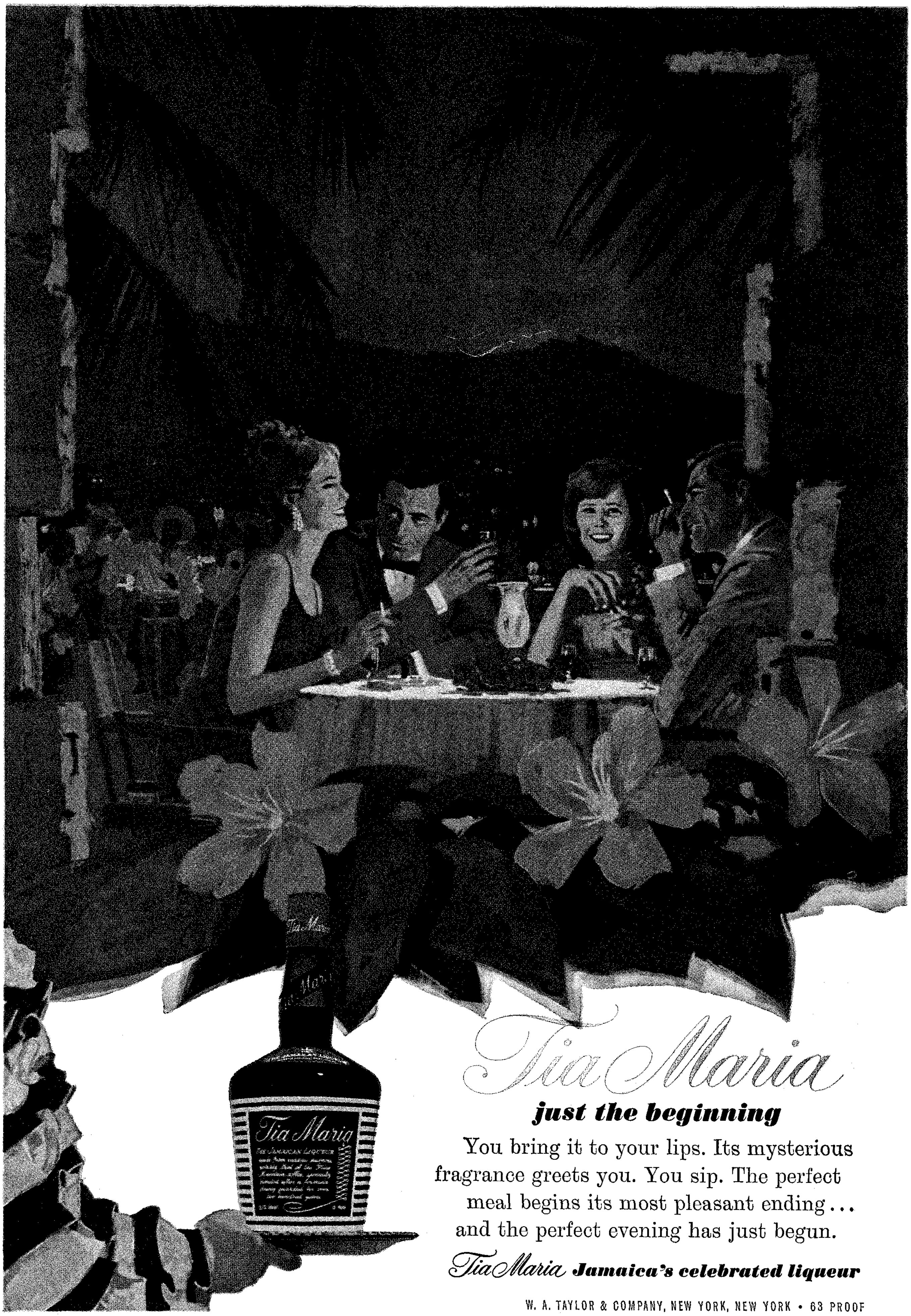
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